The Chemical Age

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Notes and Comments

Professional Unity

INTEREST in the question of professional unity in the chemical industry has been revived by the useful and in many respects original suggestions advanced by Mr. W. Johnson in THE CHEMICAL AGE last week. Innumerable schemes have been proposed for bringing about a greater measure of co-ordination, many of them excellent in theory, but most of them impracticable in application. While the number of organisations has increased, the membership of the premier societies has come to a standstill, if it has not actually decreased. Speaking at Bristol in October last, Professor G. T. Morgan, president of the Society of Chemical Industry, stated that the numbers of Fellows of the Chemical Society in the past three years were 3,980, 3,925 and 3,840 respectively, while the membership of the Society of Chemical Industry hovered round 4,550, 4,596 and 4,541, and he added that in neither case was there any hope of substantial increase. On the other hand, the Institute of Chemistry and the British Association of Chemists both show progressive increases in membership. Added to the four organisations mentioned, there are many other societies dealing respectively with various specialised branches of chemical science: analytical chemistry, physical chemistry, biochemistry, petroleum technology, colouring matters and dyes, oils and paints and several others.

As there are about sixteen scientific societies and associations concerned with matters of interest to chemists, it is evident, as Professor Morgan has pointed out, that, considered as a sectionalised profession, the chemical industry is amply provided for in most of the principal branches. The question now arises, is this sectionalisation to develop still further, with the formation of more and more specialised societies? The matter is important, for a continuance of this development means inevitably a steady loss of members to the general organisations.

Sectionalism and Re-union

ARRIVED at a certain size, each association generally acquires the services of a paid secretariat and in many cases those of an editorial staff. Sectionalism may have certain obvious advantages, but it is expensive and dissipates energy and enthusiasm. The tendency to multiply the number of new societies must involve a flight from the older and more fundamental societies, and therefore the solution of the problem must be sought in the co-ordination of the existing bodies and the elimination of overlapping of effort. Already there is a considerable measure of collaboration between the senior bodies, but actual union amongst societies is a thorny problem. In his Bristol speech, Professor Morgan said a survey of contemporary movements in chemistry necessitated a reference to the economic and financial crisis through which the British Empire was —and still is—passing. The future is menacing and uncertain, but one point seems vital, and that is that we shall have to replace many of our imports by home made commodities. Chemistry is not only a fundamental science, but also one of the constructive arts. The upshot of the crisis should therefore mean more employment for the productive chemist. The question arises whether in the near future the chemist will be able to give time to and spend money on all the many societies which cater for his professional well-being. Does not some degree of retrenchment seem indicated? Two paths are open—a perpetuation of the present system of many specialised societies with comparatively limited memberships or a re-union into one large body which shall represent practically all British chemists. An ideal which it would perhaps be unwise to emulate in its entirety, but nevertheless one that is worthy of serious consideration, was laid before the Society of Chemical Industry at its jubilee meeting last year by Dr. C. L. Parsons, who represented the American Chemical Society. The American Society now has a membership of 19,000, and has issued many valuable publications for its members, including a most comprehensive set of chemical abstracts. The suggestions put forward last week by Mr. Johnson would appear, in our view, to offer a solution to most of the problems involved, while preserving to each of the principal bodies its own identity and special objects.

Oil Industry Marking Time

FOR the first time in its history, expansion in demand for the products of the oil industry is marking time; indeed in many countries there has been an actual decline. This, too, is happening at a time when there never was a more realised and potential supply of the commodity, never greater need for it, and never greater means in existence for its profitable utilisation, or, so far as the industry itself is concerned, never a time when its products were available at so low a figure. On the other side of the account the general commodity productive capacity, and consequently the earning and spending capacity of the countries of the world, was never more able than to-day to take

advantage of the cheapening of transport and of movement as a whole which the products of the oil industry make possible.

As Sir John Cargill pointed out at the annual meeting of the Burmah Oil Company, Ltd., on June 3, it is under these conditions that the illogical is happening. International trade generally—and petroleum as an international commodity, produced in many countries, and consumed to a greater or less degree in every country of the world—is being threatened with complete eclipse, except possibly between certain points clearly defined by mutual currency standards and/or by preferential or prejudicial tariff barriers. Every ingenuity of science and engineering, all the fortitude and the best of the adventuring spirit of the youth of the world is in the air, in the water, and on land drawing the girdle smaller and tighter round the world and bringing its peoples into closer communication and contact, while politics, currencies, and national economies are creating barriers against these improvements and what they should be yielding towards the sum of human happiness and world recovery and prosperity. There is a common saying that things have sometimes to get worse before they can be better, and one can only hope that so it may be to-day—that this apparently senseless piling up and aggravation of the world's difficulties, and creation of endless obstacles to world recovery, is merely the darkest hour before the dawn of better things, and that world statesmanship will not prove so bankrupt as to fail at the eleventh hour to find the way out.

The Mercury Situation

MERCURY is one of the world's commodities of which there is at present an excess of production over demand, and efforts are continually being made to discover new outlets for its use. According to figures compiled at the request of the United States Bureau of Mines by the Customs Statistics section of the Bureau of Foreign and Domestic Commerce, the United States in 1931 exported 4,984 flasks of mercury valued at £89,400. This compares with exports of only 114 flasks in 1926, the last year for which separate figures are available. In 1931, moreover, the exports constituted virtually a net surplus of domestic production in excess of domestic consumption as imports were only 549 flasks, most of which represented deliveries under unexpired long-term contracts. While it was known even in 1930 that export business had been resumed after being virtually non-existent for many years, trade estimates generally placed the 1931 total at far below the actual figure of nearly 5,000 flasks. Approximately one-half of the total exports was shipped to Europe—Germany being the largest purchaser. Asia accounted for nearly one-third; shipments to Hong Kong being exceeded only by those to Germany. North American countries took only 856 flasks, most of which went to Canada. Mexico was formerly a fairly important market for quicksilver, but it has become an exporter of the metal during the last year or two.

Over 50 per cent. of the exports were shipped during the first four months of the year. Mercurio Europeo, the Italo-Spanish sales cartel, cut its price to the American level on June 1, 1931, and for two months domestic exports dropped to small proportions. After increasing sharply in August and September they declined to moderate proportions towards the end of the year. Shipments to the Far East were made principally from San Francisco which is the primary market for most of the metal produced in the Pacific Southwest. Exports to Europe were evenly divided between Pacific ports and New York which is the leading market for domestic consumption. Canadian shipments were routed via border ports, mostly along the St. Lawrence, but the business was probably transacted mainly through New York.

The Future of Cosach

VERY real anxiety is felt in London in regard to the proposals of the new Chilean Government so far as they affect nitrate interests. The new administration is anti-capitalist, and apparently it aspires to nationalise most of Chile's industries and to create monopolies of a great many of the ordinary articles of consumption. Chilean railways, metals and nitrate have been largely developed by British capital, the nominal amount of outstanding Chilean Loans now quoted in the Stock Exchange Official list being over £25,000,000. Cosach, the huge nitrate combine, considered alone, has a share capital of £75,000,000, which is partly of English and partly of United States origin, as well as a loan capital approximately to £40,000,000. In this concern the Chilean Government has a controlling interest, and the proposal to nationalise it would seriously affect the interests of thousands of investors in this country, on the Continent and in the United States. Cosach shareholders are entirely in the dark as to the ultimate fate of the company, and an official statement of the new Government's proposals is keenly awaited. If Chile is ready to buy out the shareholders at a reasonable price, it is doubtful if she will be able to find the new capital necessary for such a transaction. On the other hand it is not to be expected that shareholders will lightly accept the application of Russian methods in regard to their capital.

The Tanning Industry

THE recently imposed tariff on chrome calf and sides has been welcomed by chrome leather manufacturers, but they are asking for more. Most of the foreign competitors actually lowered prices to meet the imposition of the previous tariff so that no advantage accrued to the home market as a result. The fancy leather trade is busy in certain directions particularly on reptile leathers, hard grained goats and clothing leathers. There seems to be no limit to the demand for reptiles and the varieties produced baffle description. The treatment of morocco goats and finishing leathers is occupying the earnest attention of many chemists and manufacturers because foreign competitors have succeeded in employing nitrocellulose finishes on these leathers. They are being imported in small quantities from France, Czecho-Slovakia and also from Russia. They are quite impervious to water and the finish remains unimpaired after exposure to rain. The buyer is demanding these finishes on all his purchases. Progress has been made in manufacturing and mixing these finishes, but there is still a good deal of research work to be done before perfection is attained.

Personal Safety in Poisonous Atmospheres

A Choice of Breathing Appliances

This article is based on information supplied by Siebe, Gorman and Co., Ltd., London, who are manufacturers of all types of safety appliances for industrial use, especially breathing appliances.

FOREMOST among respirators which are of interest to the chemical industry is the new " Puretha " Mark IV respirator (Fig. 1), which marks a big advance over previous designs. It is claimed for this respirator that it is the most comfortable ever manufactured, provides a very wide range of vision, and can be worn for long periods without discomfort. The face-piece of this respirator is made of thick rubber, so moulded that the air space is reduced to a minimum, and is covered with an elastic textile fabric. The mask is formed to such a shape that the surface of contact between the mask and the face is a maximum, thus greatly increasing the comfort of wearing. The face-piece is held in position on the head by adjustable straps composed of several elastics, the tension of which is easily regulated to suit the individual wearer. The eye-pieces are of non-splinterable glass, and are prevented from dimming by means of ducts which lead the colder inspired air immediately over the inner surfaces in order to prevent the condensation of moisture. The inspired air, which is first drawn through a special purifying canister, is then breathed into the lungs and expired through a special valve. The eye-pieces are set close to the eyes, thus enabling their size to be reduced without impairing the vision.

Fig. 1. The " Puretha " Mark IV. Respirator

The absorbent filling used in the purifying canister varies according to the use to which the respirator is to be put, the canisters, as supplied, being painted with distinctive colours. Blue canisters, for instance, are only suitable for use in an atmosphere carrying ammonia vapour; black canisters are used for the vapours from organic solvents such as acetone, aniline, benzene, carbon bisulphide, etc.; red canisters are supplied for bromine vapour, chlorine, phosgene, sulphur dioxide and sulphuretted hydrogen; and so on. A complete list of poisonous and irritant gases and vapours likely to be met with in chemical works and the chemical-using industries has been prepared by Siebe, Gorman and Co., and special canisters with their distinctive colours are supplied to meet all these hazards.

When men have to work in an atmosphere which is not only irrespirable, but is also an irritant and a vesicant, it becomes necessary to provide suits and respiratory apparatus which will give complete protection against both sets of conditions. In these cases suits are supplied which completely envelops the wearer, including head, feet and hands, the body and trousers being joined together by a metal ring which it attached to the lower part of the body portion, and over which a rubber band, which forms the upper part of the trousers, is stretched, thus making a gas and liquid-tight joint. Similarly, the sleeves terminate in metal rings over which the elastic sleeves of the gloves are stretched.

Respirators for Dusty Atmospheres

To supply the need for a comfortable and efficient dust respirator in a variety of industries and processes, the " Pulvasorb " and the " Lane " respirators have been produced. Both patterns are, without doubt, a notable advance over the types previously available. The "Lane" dust respirator (Fig. 2) is comfortable to wear, and is so designed that it makes a perfectly airtight joint with the face by reason of the feather-edge, which is drawn tightly against the face when a negative pressure is produced within the respirator on inhalation. The rigid part of the device is made of non-corrodible composition, ensuring freedom from damage by acids or moisture. By a simple arrangement of valves the filter is kept dry, and although it is usual to change the filter after 8 to 12 hours, in many cases it can be used for much longer periods. The standard type of filter provided is extremely efficient against dusts composed of very fine particles, other types of filter can be used when protection is merely required against coarser dusts or fibres.

The " Pulvasorb " dust respirator offers several important advantages over older types. Moulded to a new shape, with smoothly rounded periphery, it affords absolute comfort combined with utmost efficiency. The pliable facepiece of high quality black rubber has a pleasant, cleanly odour of pine tar. An important feature is the provision of a non-return inlet valve which prevents the exhaled, moisture-laden air from passing out through the filter and thus increasing the breathing resistance. The outlet valve is proivded with a protecting cover which directs the exhaled air downwards, away from the face. The mask is fitted with a pliable wire arrangement at the nose, enabling individual adjustment to be made at this point. It is secured to the face by adjustable

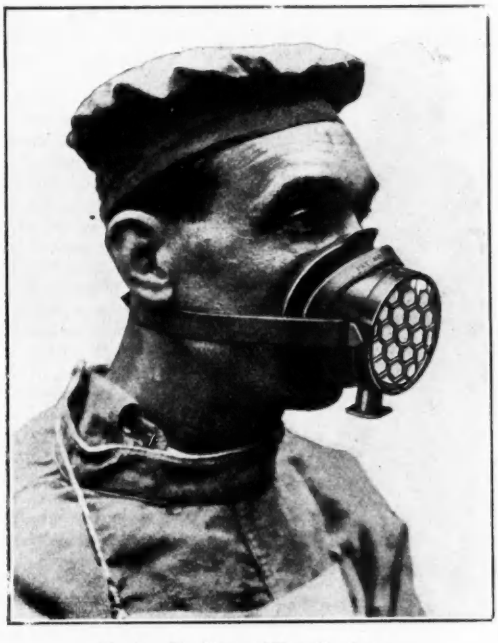


Fig. 2. The " Lane " Dust Respirator

Fig. 4. The " Pulvasorb " Respirator with Disc Filter

elastic bands. Three types of filter are supplied: (a) the bag filter (Fig. 3), which provides a very large surface and is particularly suitable for very dusty jobs; (b) the sponge filter; and (c) the disc filter (Fig. 4), which consists of one or more discs of a specially prepared material, the number of discs used being varied to suit the requirements of the wearer.

High Concentrations of Poisonous Gas

In certain cases, notably where very high concentrations of gas are encountered and in atmospheres deficient in oxygen, it is necessary to provide apparatus which supplies the wearer with air other than that which surrounds him. Such apparatus are of two types, (1) that in which fresh air is drawn or pumped through a length of air pipe, and (2) self-contained oxygen breathing apparatus. Of the former, the " Antipoys " short-distance breathing apparatus and the " Spirelmo " smoke helmets are the types available, and of the latter, the " Proto " and " Salvus " are well-known and used in all parts of the world.

The " Antipoys " short-distance breathing apparatus is available as a full-mask type (Fig. 5), as a ori-nasal half-mask type, and as a mouthpiece and nose-clip type. The whole-mask pattern is provided with a mask similar to that of the " Puretha " respirator, which covers the whole face and is secured to the head by adjustable elastics. This mask is fitted with a non-return outlet valve of vulcanised indiarubber and a non-return inlet valve of special design. At the lower or air inlet end of the valve body is fitted a flexible corrugated tubular chamber to which is connected a length of tube, which is led to fresh air. The chamber is designed so as to enable the wearer to breathe through a long length of tube without undue effect. After each inhalation, and during expiration, this chamber automatically fills with air, ready for the next inhalation. The long tube, which has a smooth bore to prevent undue friction of passage of the air, is internally armoured to prevent collapse in case it should be trodden upon, and the waist-belt provided is fitted with a clip which secures the air tube in position and prevents it from dragging on the mask. Breathing through the apparatus proceeds quite naturally and the wearer is enabled to work for an indefinite time. The half-mask pattern consists of an enamelled sheet steel half-mask which encloses the nose and mouth, and is fitted with an india-rubber pneumatic pad, readily inflatable to suit the wearer's face, and to make an airtight joint between face and mask.

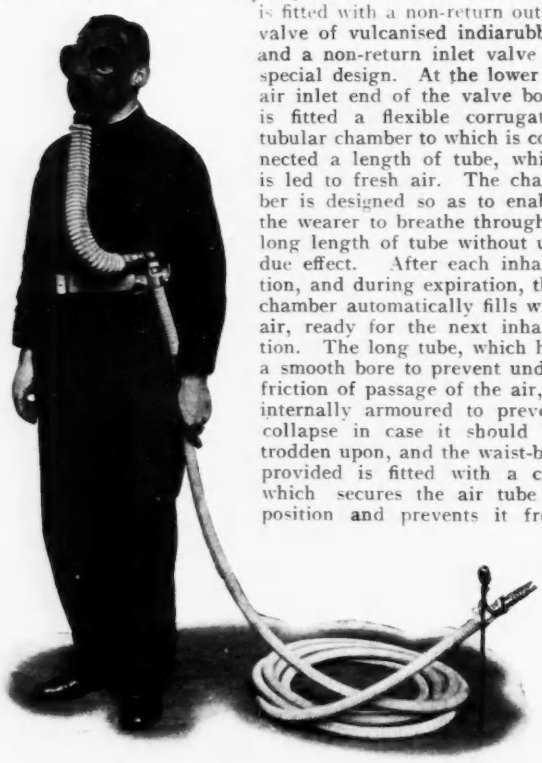


Fig. 5. The " Antipoys " Short Distance Breathing Apparatus (full-mask type)

The " Proto " self-contained breathing apparatus (Fig. 6), is designed to supply the user with a factitious but perfectly respirable air, entirely independent of any communication with the outer atmosphere, for one or two hours according to type. It has no air pipe or other connection with the base of operations, so that for recovery and rescue work in mines, etc., its scope of usefulness is practically unlimited, the wearer being safe in the most poisonous gases, and able to walk any distance and to explore the most intricate workings of a mine with every freedom of action. The principle of the apparatus is that the wearer breathes the same air over and over again, the carbonic acid being absorbed from it after each expiration, and at the same time the requisite amount of oxygen is restored to it, thus rendering it pure and fit to be again inhaled. The " Salvus " apparatus is suitable for a time-limit of only half-an-hour, but both the " Proto " and " Salvus " enable the wearer to work freely at any distance from the fresh air base of operations, without any connection whatever with the base, and in any irrespirable atmosphere—no matter how poisonous or deficient in ogygen. Unlike some other designs of breathing apparatus using compressed oxygen, the " Proto " dispenses with the use of injectors and helmets. It works entirely under positive pressure, and is quite comfortable to wear, its parts being so disposed as to balance its weight perfectly. The total weight of the single cylinder two hour pattern, when fully charged, is only 37 lb.: that of the twin cylinder pattern is 39 lb.

Fig. 3. The " Pulvasorb " Dust Respirator with Bag Filter

The " Proto " apparatus consists of a steel oxygen cylinder, containing 10 cubic feet of oxygen gas compressed to not less than 120 atmospheres (about 1800 lb.) per sq. inch. A reducing valve is fitted to the delivery connection of the main valve on this cylinder and is so adjusted as to pass a regular supply of 2 litres of oxygen per minute, no matter what the pressure may be in the cylinder. This reducing valve (which is fitted with a by-pass, operated by a small wheel valve, so that in the event of the reducing valve through any cause failing to act properly, the wearer of the apparatus can supply himself with what oxygen he requires direct from the cylinder) delivers the oxygen gas through a flexible tube to the

breathing bag which is carried in front. This bag containing the absorbent for removing carbon dioxide from the exhaled oxygen, is of strong vulcanised india-rubber, protected by an outer bag of tanned canvas, and has two compartments, which are in communication near the bottom. When the wearer exhales, the air passing down one side of the partition of the breathing bag and through the absorbent, and thence up the other side of the partition to be again inhaled, after mixing with fresh oxygen, which is being constantly delivered from the oxygen cylinder. It will therefore be seen that the wearer is provided with a breathing system which is entirely isolated from and independent of the surrounded atmosphere for a duration of two hours.

Safety in Dense Smoke and Fire

The "Spirelmo" smoke helmet (Fig. 7), enables the wearer to pass through dense smoke to the seat of a fire and to quench it before it has time to gain the upper hand. It is also suitable for ammonia fumes and other noxious atmospheres. These helmets, which are blocked from raw hide and covered with asbestos if desired, are all fitted with strong mica windows in aluminium hinged frames or in fixed round goggles, and with air inlet connection and valve for the escape of excess and vitiated air. They are unaffected by heat, retain their shape in all climates, and will withstand hard usage without risk of injury. A simple arrangement inside the crown adjusts the helmet to suit all sizes of heads, and a flexible leather extension, which is tucked under the wearer's coat or vest, effectually seals the lower part of the helmet. An ample supply of air is delivered by special double-acting bellows through non-collapsible air-tube having embedded wire, or armouring, and metal couplings. The hinged square windows give a wider field of vision than the round eyes, and are made so that they can be instantly opened and closed, for which purpose a special locking device is fitted.

A recent addition to the range of safety appliances made by Siebe, Gorman and Co. is the "Fireox" apparatus. This

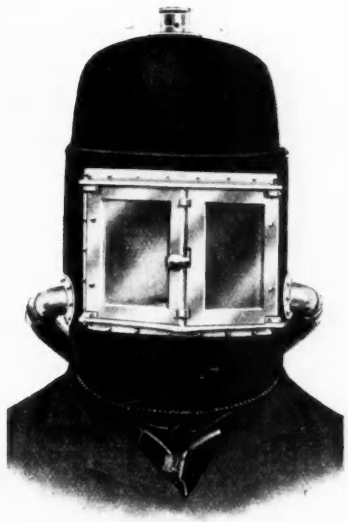


Fig. 7. The "Spirelmo" Smoke Helmet

self-contained apparatus, as its name implies, renders the wearer quite independent of the surrounding atmosphere. He carries with him his own oxygen supply compressed in a steel cylinder, and his exhaled air is purified by its passage through chemicals which absorb the carbon dioxide. The apparatus is automatic in action and lasts, according to type, from half-an-hour to two hours on a charge of oyxgen and CO_2 absorbent.

Fig. 6. View of "Proto" Self-contained Breathing Apparatus showing Reducing Valve and other connections

A New Source of Iodine

Preparation from Well Waters in Java

THE preparation of iodine from certain well waters of Java is described by Schantl. ("Chem. Zeit.," 1932, p. 341). Large quantities of such waters are available, and are usually associated with petroleum deposits. The water, as pumped from the well, is alkaline in reaction, and contains a high proportion of saline constituents, including potassium chloride, 1.597; sodium chloride 28.418; calcium chloride 2.334; magnesium chloride 1.146; magnesium iodide 0.153; sodium carbonate 0.021; calcium carbonate 0.016; magnesium carbonate 0.035, and silicic acid 0.045 grams per litre.

There are other supplies of iodide-containing waters in the East Indian Islands, but they are of less economic importance than those in Java. The method used at Sepandang consists in first pumping the water into a storage tank, where it is allowed to trickle down an SO_2 tower in order to effect any reduction. It is then run into troughs and well agitated with bundles of copper wire. Cuprous iodide is formed which precipitates out. The wire bundles are removed and kept in a slightly acid solution of copper sulphate solution. The liquor containing the cuprous iodide is filtered through hair or vegetable fibre cloths, any copper in the filtrate being recovered by iron scrap. The precipitate is washed with water containing a little sodium bisulphite to prevent oxidation of the cuprous iodide, then filter-pressed and dried. The material at this stage is of a yellowish grey colour and contains about 52-55 per cent. of iodine. It has the advantage of being a non-hygroscopic substance which is a great point in a damp tropical climate such as that of Java. The process is said to be cheap and the cost of copper relatively low.

Safety Electrical Appliances in Chemical-Using Factories

By J. H. WEST, M.I.Chem.E.

In the first part of this article, which appeared in last week's issue (pp. 511-512), Mr. West dealt with the use of flame-proof apparatus and the choice and situation of electric motors in connection with the minimising of risks of explosion and fire in buildings where inflammable liquids and vapours are used. In his concluding notes, he examines the problems of switch-gear, lighting systems and the proper protection of wiring installations.

PRACTICALLY all types of switchgear are obtainable in flame-proof construction, including oil-break and air-break circuit breakers, motor starters of various kinds, and ordinary switches. Fig. 3 shows an oil-break circuit breaker by Geo. Ellison, Ltd., with the oil tank lowered for filling or cleaning, showing the flame-proof flange on the tank. There is, of course, not such a wide range of flame-proof switches and starters available as of ordinary industrial types, and they are fairly expensive; it is therefore well to keep all main circuit breakers and main switches outside the danger buildings as far as possible, so that non-flame proof types can be used. Motor starters generally have to be near the motors,

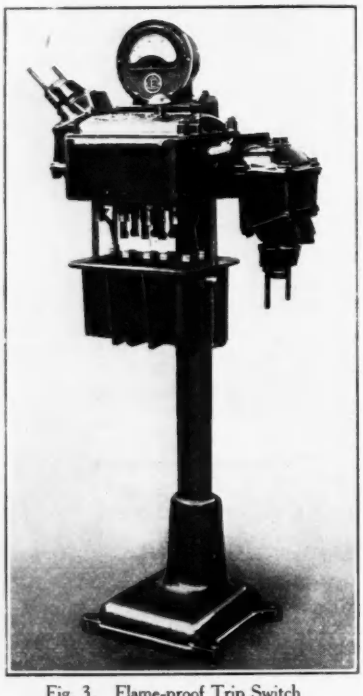


Fig. 3. Flame-proof Trip Switch (George Ellison, Ltd.)

but even these can sometimes be arranged outside the building. Similarly, distribution boards and fuse boxes are best kept outside danger buildings, so as to avoid the extra expense of flame-proof gear.

Lighting Systems

External lights are by far the safest and cheapest in capital cost where danger buildings are concerned. A large reflector with fairly high power bulb is fitted outside each window, and at intervals along the roof lights, if any, the whole being wired up in ordinary industrial conduit, and all distribution boards, fuse boards, and switches being fixed outside the building. In a multi-storey building the switch controlling the lighting of each floor may conveniently be placed on the corresponding landing of the external fire staircase, should such a staircase exist, and it most certainly ought to in all high buildings where inflammable liquids are used. It is surprising how good the lighting inside the various floors can be with the external method when properly carried out, but the correct placing and directing of the reflectors is a matter for experts. Fig. 4 shows the exterior view of a building lighted in this way way, the installation in this case having been designed by Benjamin Electric Ltd., of Brantwood Works,

Fig. 4. Night time view of British Industrial Solvents factory at Hull. The interior illumination is obtained by the exterior mounting of elliptical angle reflectors. Photograph by permission of the Distillers Company Ltd. (Edmund's Electricity Corporation, Ltd.)

Tottenham, and carried out by Edmundson's Electricity Corporation, Ltd., of Tothill Street, Westminster.

With exterior lighting bulbs of somewhat higher wattage have to be used, and the operating cost is therefore higher than with ordinary interior lighting, but the difference should not exceed 25 per cent. and the high degree of safety secured, together with the low installation cost compared with flame-

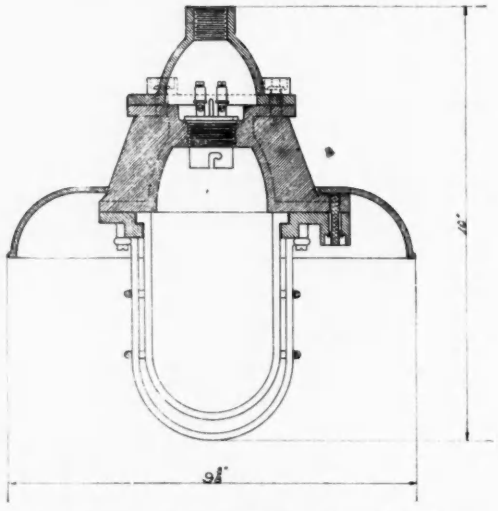


Fig. 5. Cross-section of a 60-watt Light Fitting (Heyes and Co. Ltd., Wigan.)

proof internal fittings makes it worth while. With exterior lighting it cannot be avoided that shadows are sometimes cast by some piece of plant or apparatus standing in front of and

fairly close to a window, but this can often be remedied by placing the reflectors in special position or by using the flameproof fittings. Fig. 5 shows the cross-section of a 60-watt fitting by Heyes Ltd., of Wigan. The well-glass is permanently sealed into a flanged iron ring which bolts on to the main portion of the fitting, and a sealing chamber is provided to isolate the fitting from the terminals and wiring. Fins are provided on the top of the fitting to radiate the heat and keep the fitting cool. Similar fittings to take larger bulbs are available, and also the so-called bulkhead type.

Portable Lamps

The ordinary handlamp connected by a length of workshop cord to a plug and socket is highly dangerous, and must be rigidly excluded from all danger buildings. For such purposes the miners' accumulator hand lamp should be used. This lamp is arranged to burn for 8 hours, and gives a good light, while charging stands and small motor generators are available, which make re-charging a very simple routine operation. Fig. 6 shows one of these lamps by Ceag, Ltd., of Barnsley, Yorkshire, arranged as a barrel searcher. It can also be obtained with an ordinary bulb on the top of the lamp, protected by an outer well glass and provided with a reflector. There is an automatic device which entirely disconnects the accumulator in case the well-glass gets broken. The type shown has a 4-volt battery and gives considerably more light than the standard 2-volt lamp. While these lamps give a good light for most purposes, it is sometimes necessary to have

Fig. 6. Barrel Searcher type of Portable Lamp (Ceag, Ltd.)

a better light during repairs to the interior of large vessels, when the plant is shut down and there is little or no danger. To meet this need it is convenient to fix one or two plugs and sockets outside the buildings, so that an ordinary handlamp can be connected up with the cord taken through a window or doorway to the required point, but the sockets should be of a type capable of being padlocked, and the keys of the padlocks should be kept by the works manager, to ensure that these handlamps are only used when the conditions are safe.

The Wiring System

All wiring should be of high quality. Conduits should be avoided as forming possible pockets for inflammable vapour. Lead-covered or armoured cables should be used for motors, and preferably lead-covered wiring for lighting circuits, since

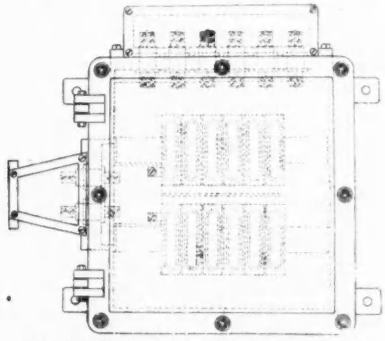


Fig. 7. Explosion-proof distribution board (Heyes and Co. Ltd).

most of the volatile liquids attack rubber. Junction boxes should be flameproof, or of a pattern which is " run in " solid with compound after connecting up. Special attention should be paid to earthing efficiently all motor and switch casings, and also the armour or lead covering of cables and wires. The wiring should preferably be carried out by a competent electrical contractors who have had experience of flame-proof work; this is not a job for the work's electrician. Fig. 7 shows a flameproof distribution board by Heyes and Co., Ltd.

Apart from the electrical installation, the danger from static electricity must be guarded against. The friction caused by non-conducting liquids flowing through pipes may produce enough potential to cause a spark. Tanks, pumps, and pipes used for inflammable liquids should therefore be efficiently earthed. Since the bolts on flanged joints made with non-conducting jointing material cannot be depended upon for electrical continuity, all such joints should be " bonded " by a strip of copper tape. A patch on the back of each flange should be filed up bright and the tape be fastened to this by brass set-screws screwed into tapped holes in the flanges. Provided the metal surfaces are thoroughly clean this makes a good connection, and is better than soldering, which is troublesome in case the pipe-joint has to be broken. Static is particularly likely to appear where a liquid is pouring from a pipe into a tank, hence pipe inlets should be bonded to the tank, and both should be earthed. In the case of drums or moveable containers, a piece of brass chain, earthed at one end, can be hooked on to the bung-hole of the drum. Long pipe lines should be earthed at several points.

To illustrate the way in which explosions occur, two instances may be given. In one case an inflammable liquid was being pumped by a ram pump into an overhead tank. The man in charge of the operation had forgotten to open the inlet valve into the tank. Had the pump been a centrifugal nothing would have happened, but, it being a ram pump, a high pressure was developed in the pipe which split, and a jet of liquid hit an unprotected electric bulb which broke, causing an explosion which killed several men and wrecked the works. In the other case, an inflammable solvent was about to be steamed from a charge in an extraction apparatus. Steam was turned on to the jacket of the extractor before the outlet to the atmosphere was closed, and while the man was on his way to close this he was called away. In consequence of this the building filled with vapour which poured down to a lower floor where there was an unprotected D.C. motor. The subsequent explosion killed one man and wrecked several buildings. In both cases the human element was at fault, and therein lies the danger. A third instance may be cited from the writer's experience where proper precautions *had* been taken. One of three large storage receivers containing highly inflammable liquid under pressure burst owing to one of the welds giving way, and several thousand gallons of the liquid were projected into the

room. So violent was the burst that heavy steelwork was bent, and the next receiver was shifted several feet. There were two flame-proof light fittings in the room near the receivers, though the lights were not on at the time of the accident, and there were motors running in another part of the building. No fire or explosion followed, and the light fittings were found to be undamaged. There is no reason to doubt that had ordinary industrial lights been burning in the room a disastrous explosion would have resulted.

The Home Office have a special staff of Electrical Inspectors, who are thoroughly conversant with the risks covered in this article and the precautions necessary, and any firms using inflammable liquids, who are in doubt as to whether their electrical installations are on the right lines, can write to the Chief Electrical Inspector of Factories at the Home Office, Whitehall, S.W.1., and ask for one of these inspectors to be sent to the factory to give advice, or to examine and pass the installation when completed.

The Society of Public Analysts

Papers on Aluminium Problems

An ordinary meeting of the Society of Public Analysts was held at the Chemical Society's Rooms, Burlington House, on June 1, Mr. F. W. F. Arnaud, president, being in the chair. Certificates were read for the first time in favour of A. Littlewood and J. H. Weber, and for the second time in favour of C. C. Marginson, W. Mather, A. D. Mitchell and M. Niyogi. The following were elected members of the Society:—R. H. Hopkins and W. B. Walker.

Three papers were read and discussed: (1) "The Determination of Aluminium in Foods," by Dr. L. H. Lampitt and N. D. Sylvester; (2) "The Spectrographic Determination of Small Quantities of Aluminium," by P. L. Bilham; and (3) "The Physiological Effects of Aluminium," by Dr. J. H. Burn. Notice was given that a joint meeting would be held with the Food Section of the Society of Chemical Industry, on the subject of "Changes in Fruit on Storage," on October 5.

Aluminium in Foods

The paper on "The Determination of Aluminium in Foods" outlined a method for the accurate determination of small amounts of aluminium in foodstuffs, in which the Aurin tricarboxylic acid lake is formed under standardised conditions, the red colour of the final solution being measured in the Lovibond tintometer. Separation of aluminium from the "wet ash" of the foodstuff is effected by a preliminary precipitation with ammonia, the aluminium being obtained in alkaline solution. Other metals which are liable to be present have been proved not to interfere.

The actual determination is carried out on an aliquot portion containing 0.01 to 0.06 mgrm. of aluminium. Using 20 grm. of sample as little as 0.2 parts per million of aluminium can be determined. Some results were given which indicate that the aluminium content of foodstuffs is increased by only a few parts per million after cooking in aluminium utensils. For example, the aluminium content of milk was increased from 0.4 to 0.6 parts per million after boiling in an aluminium saucepan, and to 2.5 parts per million after standing overnight. Apples before cooking contained 2 parts per million of aluminium, and after boiling in an aluminium vessel for 30 minutes with sugar and water they contained 14 parts.

In his paper on "The Spectrographic Determination of Small Quantities of Aluminium," Mr. P. L. Bilham stated that a method of concentrating the aluminium content of a biological material on to an electrode has been devised so that no possible loss occurs. The spectrum is then excited by a condensed spark discharge modified to remove air-lines as much as possible, and a quartz spectrograph is employed to photograph the spectrum. The plate is developed under standard conditions and then compared with sets of standards on plates prepared under precisely similar conditions. The results show that aluminium is detectable, down to 0.01 mgrm., and that the intensities of the lines at 3944A and 3961.5A can be used to judge the amount present up to 0.2 mgrm. The method is, of course, specific for aluminium and of a reasonable accuracy.

Physiological Effects on Aluminium

Dr. J. H. Burn stated in his paper that the first extensive investigation of the physiological effects of aluminium salts was made in 1886 by Siem, working under Professor H. H. Meyer. Siem found that doses corresponding with 30 to 40 grains of alumina for a man had no effect whatever when administered by mouth to cats daily for four weeks. When the aluminium salt was injected under the skin, the fatal dose varied from 0.25 to 0.30 grm. of alumina per kilogram. These results, indicating that aluminium has some toxicity when injected, but is harmless by mouth, have in substance been confirmed by many subsequent workers. Siebert and Wells examined the pathological changes produced by injecting alum and aluminium chloride. They found that anemia was manifested after nine or ten daily injections, a fall in the haemoglobin percentage and in the red cell count being recorded. In the spleen, pigmentation, thrombosis and fibrosis were observed. The experiments of McCollum and his colleagues, and those of Myers and Mull, show conclusively that the addition of aluminium salts to the diet of young rats has no ill effect on growth, health and reproduction, even when four successive generations are observed. The experiments of Myers and Morrison, and of Underhill and Peterman, show that when aluminium compounds are given by mouth to dogs, only insignificant changes in the amounts of aluminium in different tissues are found; it follows that aluminium salts are not absorbed from the alimentary tract, except in traces.

As a result of a scare in the United States that the use of alum in baking powders was dangerous to health, the Department of Agriculture instituted a board of inquiry. The report described experiments on twenty-six university students carried out in three different universities, who were given amounts of alum varying from 0.2 grm. to 10 grms. daily for about six months. It was unanimously reported from the results of these experiments that the amounts of alum likely to be consumed as a result of alum in baking powder, estimated as up to 1.16 grain of aluminium per person per day, are much too small to have any ill effect. The amounts of aluminium which arise from aluminium vessels are estimated from analyses carried out by Massatch to be about 0.1 grain per person daily.

The dangers arising from aluminium utensils have been thoroughly investigated by many workers, on many species of animals; they have also been investigated with equal thoroughness on man. These dangers are non-existent. Clinical reports that symptoms of abdominal pain are relieved by discontinuing the use of aluminium must be ascribed to psychological effects, which are common in medical practice.

An Irish Dextrine Factory

Possible Increase In Tariff

The likelihood of the Irish Free State Government increasing the present tariff on glucose (£5 per ton), and imposing new duties on dextrine, pastes, tapioca and cattle foods, has aroused interest in the plan, mooted last year, for the establishment of a factory at Athlone for the manufacture of these products from potatoes. The company to operate this scheme was formed in 1929 and is known as Irish Agricultural Industries Co., Ltd., and the directors are stated to be one Irishman, two Frenchmen and two Belgians. A difficulty which might arise, our correspondent learns, is that the Minister for Industry and Commerce proposes to control the number of factories operating in the Free State on foreign capital.

Should the scheme materialise, potato supplies will be drawn from the counties Galway, Roscomon, Mayo and Louth and the factory would assist agriculturists by absorbing the surplus products which are often, under present conditions, sold at a loss or allowed to rot. A duty has already been imposed on potatoes entering the Free State, and it is understood that this will later apply to potato products, thus giving the factory a large measure of protection in the home market.

The Society of Glass Technology

Address by Professor G. T. Morgan

THE 144th ordinary general meeting of the society of Glass Technology was held in the Science Museum, London, on May 24-25, the president, Mr. Edward Meigh, being in the chair at both sessions, the first of which was devoted to an address by Professor G. T. Morgan on "Some Research Problems in Applied Chemistry."

In the course of his address Professor Morgan described a few typical research problems which had presented themselves to the scientific staff of the Chemical Research Laboratory at Teddington, and referred to the formation of several varieties of tar and the importance of being able to utilise this vast by-product. Low temperature tar, which is a product of the present century, produced by carbonisation of coal at temperatures of 450°-650°, presented an anomaly in that some of its constituents were sensitive to heat, being decomposed at temperatures as low as 150°. Methods for examining this tar were described and the chemical constituents which had been isolated and identified were enumerated. This research had shown that this tar contained two main classes of substances, (a) crystalloids, including the phenols, acids, bases and hydrocarbons; and (b) resinoids, a non-crystallisable group of materials resembling in other respects the four chemical groups mentioned. It was found that as the temperature of carbonisation was raised the resinoids disappeared, being replaced by more complex, sparingly soluble materials grouped under the generic name of "free carbon." The temperature of carbonisation also affected the nature of the aqueous liquors accompanying the tar, which were being acidic at 450°, neutral at 510°, and at 650° ammoniacal. The full examination of these liquors had shown that they too contained crystalloids and resinoids.

Professor Morgan then dealt with instances of the great progress made in the synthesis of chemicals, describing the production of methyl alcohol by condensation of carbon monoxide and hydrogen. The nature of the product obtained had been found to vary when the catalyst was varied, the addition of alkali yielding less methyl alcohol, with greater proportion of the higher alcohols, while cobalt chromate added to the zinc chromate catalyst resulted in the production of a considerable proportion of ethyl alcohol.

Development of the Autoclave

The various stages in the development of the autoclave were indicated, and specimens of several interesting types were displayed. The latest type, capable of working at pressures above 50 atmospheres, was made of heat resisting steel, and was fitted with pressure gauge, inlet and outlet valves, and stirring gear of special pattern. Particulars were given of the many uses to which these autoclaves had been put, including the hydrogenation of tar products, in which non-volatile resins were hydrogenated to light oils; the dehydrogenation of pyridine by means of ferric chloride, and the carbonylation of organic compounds by means of carbon dioxide, in presence of a catalyst, yielding some drugs and dye intermediates. In certain operations involving the use of ammonium chloride, the autoclave lining had been found to be seriously and quickly corroded. A silver container had shown much greater resistance under these conditions than had the stainless steel containers.

Researches on the production of synthetic resins were also outlined in the latter part of Professor Morgan's address, this work being linked up with that on tar. Some of the alcohol-soluble resins termed "Novolaks" served as substitutes for shellac. Alkaline condensations led to insoluble Bakelites, the most important commercial variety of synthetic resin. As resins derived from coal tar products tend to darken in colour on exposure, the present trend of research was for a resin which would not suffer discolouration, and which would also resist the action of water.

During the second session the electrical conductivity of sodium-metasilicate silica glasses was dealt with in a paper by E. Seddon, E. J. Tippet and Professor W. E. S. Turner. In presenting this paper, Dr. Seddon briefly reviewed the work on this subject done by Gehloff and Thomas, Fulda, and Schwarz and Halberstadt. The present investigation was confined to a series of two component glasses, namely, those containing soda and silica. The influence of temperature upon the electrical conductivity of each member of the series was investigated from room temperature up to the softening point cylindrical specimens being employed. The glasses were melted from pure chemicals, in a platinum crucible to ensure purity of composition. Measurements of the electrical conductivity were carried out in vacuo in a thick-walled fused silica vessel fitted inside an electric furnace, the electrodes being of platinum. Considering the effect of chemical composition upon the conductivity it was shown that an increase in soda content led to an increase in the sodium atoms available for ionisation, and hence to a greater conductivity of the glasses.

Colour of Selenium Ruby Glass

The colour of selenium ruby glass was the subject of a paper presented by H. P. Rooksby, who explained how the attainment of colour in a selenium ruby glass was often a matter of trial and error, and an endeavour had been made to ascertain the cause of the colour so as to enable the manufacture of such glasses to be placed upon a sounder basis. In copper and gold rubies the presence of colloidal particles was confirmed. The selenium glasses contained zinc, cadmium and boron as special constituents. The colouration was found to be caused by the precipitation of particles composed of a solid solution of cadmium sulphide and cadmium selenide. These particles were identical with those obtained in red pigments. It was therefore suggested that the colour of the glasses was largely due to the colour of the precipitated particles rather than to their size and nature, in the case of gold and copper rubies. It was further shown that selenium glasses could be classified broadly into two types, one in which colour was essentially independent of heat development treatment, and the other in which the colour varied with the temperature of development. For a stable colour, the cadmium content should be relatively high.

The Formosan Sugar Industry

Its Present Scope

THE acting British Consul at Tamsui, in the course of a memorandum on the sugar industry of Formosa, states that, shortly after the control of Formosa came into Japanese hands in 1895, projects were made for building up the sugar industry so that the Japanese Empire should eventually be independent of outside sources of supply. Nothing much was done until the new century, when an up-to-date refinery fitted with modern machinery was established in the south of the island. It was clearly and quickly demonstrated that the old-fashioned and wasteful methods of the Chinese mills would have to be replaced by modern arrangements under Japanese control. By an import of good canes, attention to irrigation where necessary, and better treatment of the soil, the crops soon started to show increased yields, but, due to a variety of causes, the industry was not, in 1913, in a happy state, being, on the whole, financially unsound. The European war, however, proved a boon and production increased tremendously. The output of centrifugal and white sugar rose from 5,729,500 piculs in 1921-22, to 9,527,700 piculs in 1927-28 and to 13,118,000 piculs in 1930-31, the estimated production for 1931-32 is 16,027,800 piculs. Brown sugar, which stood at 147,800 piculs in 1921-22, was 169,900 piculs in 1930-31, the peak of production being reached at 218,600 piculs in 1925-26.

The present requirements of the Japanese Empire are stated to be about 14 million piculs annually, and it will, therefore, be seen that an adequate supply is now assured. Allowing for the normal population increase and for occasional diminution in yields due to typhoon and other damage, Formosa can nevertheless guarantee to fulfil her duty of supplying the sugar needs of Japan and her dependencies. The growth of the industry has been encouraged (a) by reserving the Japanese market for whatever quantity Formosa could supply; (b) by local government subsidy to research work, and (c) by local government adoption of the policy of increased production.

Industrial Uses for Rubber Latex

Developments in the United States

The importance of latex in the direct manufacture of rubber goods may be grasped from the fact that during the year 1930 there were imported into the United States several million gallons of latex, the dry rubber content of which was 2,500 tons.

ALTHOUGH it has long been known that latex upon evaporation leaves a film of rubber, no practical commercial application of this property was made until within the last ten years. This latex, according to a paper which appears in the "Journal of Chemical Education," is imported into the United States in two forms: either in its original condition as obtained from the tree, with the addition of a small amount of a preservative such as ammonia, or in a concentrated form with the addition of stabilising materials such as soaps or gums. The latex in the unconcentrated form constitutes probably about three-quarters of the total imported into the United States. It is used by one manufacturer of cord tyres, the web of cords being impregnated and covered with a layer of rubber, not by the usual procedure of frictioning and coating on a calender, but by drawing it through a bath of a compounded latex containing pigments, sulphur, accelerators, etc., the impregnated web being dried by passing it over heated drums. The concentrated latex used in the manufacture of rubber goods either by the so-called anode process or by the dipping process is imported in several forms, such as Revertex, prepared by evaporating latex at the plantation in a rotary drier until the total solids are between 75 and 78 per cent. (the evaporated latex contains a small amount of added soaps for the purpose of stabilisation); Uterex, prepared at the plantation by removing from the latex a portion of the water by means of a centrifuge of the milk separator type, the rubber content of the latex thereby being increased to about 60 per cent.; Lotol, prepared by the creaming of latex to which has been added between 0.1 and 0.2 per cent. of a solution of Irish Moss or gum tragacanth; and Vultex, which is vulcanised latex having a rubber content of about 50 per cent.

Manufacture of "Dipped Goods"

Two methods of manufacturing so-called dipped goods in the rubber industry from latex are now coming into common use. Until recently such goods were prepared almost exclusively by dipping into rubber cement a form having the desired shape, withdrawing it, allowing the solvent to evaporate, and redipping it until the required thickness was obtained. In the manufacture of surgeons' gloves, for example, having a thickness of 0.008 to 0.010 of an inch, six to eight dips were required, whereas in the case of electricians' gloves, having a thickness of 0.040 of an inch, twenty to twenty-four dips were necessary. After the complete evaporation of the solvent the formed article was "cured" either by exposure to vapours of sulphur chloride or by dipping into a dilute solution of sulphur chloride in benzol or carbon disulphide, or by heating in open steam, in which case it was necessary to use sulphur in the dipping cement.

In the dipping process using latex as a source of rubber a form of a suitable material is coated with a film of a solution which acts as a coagulant for rubber, for example, solutions of barium, strontium, calcium and magnesium chlorides. The form is dipped into the latex compounded according to the quality of the goods desired and is allowed to remain therein for a few minutes. If a thicker deposit is required, the process is repeated. The coagulum still on the form, after drying for complete removal of water, is vulcanised in open steam or in hot air.

The Anode Process

The anode process depends on the fact that when an electrical current is passed through latex the rubber particles, being negatively charged, move toward the anode and are discharged with the formation of a coagulum. In this process the pigments and the sulphur having a particle size of 0.5 to 2.0 $m\mu$ are added to the latex, which is then brought to a pH value of 9.5 and a conductivity of 0.0045 to 0.0050 mho. This latex is placed in a tank in which is suspended a cathode, usually an iron plate, and an anode of zinc which has the dimensions and shape of the article to be manufactured. A current having a density between 0.05 and 1.0 ampere per sq. in. is applied, the density and the time of flow of the current depend upon whether thin articles such as surgeons' gloves or thick articles such as electricians' gloves are to be deposited. During the passage of the current zinc oxide is formed in small quantities at the anode and the negative charge of the latex particles is neutralised, causing coagulation. After a sufficiently thick deposit has been formed the anode is removed from the latex bath and after complete drying in air is heated either in steam or hot water in order to vulcanise the deposited rubber.

The quality of articles prepared from latex is much superior to that of goods made from rubber cement; the tensile strength varies between 4,500 and 5,000 lb. per sq. in., with an ultimate elongation of about 900 per cent.; their ageing properties and their ability to withstand repeated boiling in water followed by drying out, as, for example, in the sterilisation of surgeons' gloves, are excellent; their electrical properties are exceptionally good, for example, electricians' gloves having a thickness of 0.040 of an inch have a uniform breakdown test of 26,000 volts. From properly compounded latex a deposit of rubber, either soft or hard, may be built up on irregularly shaped articles such as plating racks and dipping tanks used for electroplating, forming racks, washing trays, fan blades, including fans for handling corrosive fumes and suspensions of abrasive materials, spinnerette tubes for the rayon industry, perforated metals and screens for wet screening, and a great variety of other objects used in industry.

Artificial Latex

A process has recently been worked out for the conversion of rubber into artificial latex. This may be accomplished by the prolonged mastication of rubber in an enclosed mixer with the slow addition of an aqueous solution of a protective colloid, such as glue. The glue solution is taken up by the rubber in the form of a very fine emulsion; when the concentration reaches a certain point an inversion of the structure results; the rubber breaks down into very fine particles having dimensions of between 1 and 3 $m\mu$, the glue solution then becoming the continuous outer phase. At the present time only a relatively small quantity of artificial latex is used in industry, mainly because of its excessive cost; however, when it is desired to secure a thin, tacky film of rubber the artificial latex may be used to advantage. Since such latex improves adhesion between rubber and fabric plies, it finds a limited use in the spreading of fabrics.

Latex is also being used on a small scale in the manufacture of a paper which is translucent, with a high tensile strength and great resistance to tear, and to a limited degree in the manufacture of imitation leather. During the past year one manufacturer in the United States has brought out a carpet in which the pile, instead of being locked in place by the warp in the burlap backing, is made to adhere to the backing by means of rubber latex. It is claimed that by this method it is possible to manufacture carpets having long life and lending themselves to a great variety of artistic effects.

Parent Coal Carbonisation Trust

Petition to Stand Over

IN the Companies Court on June 6, Mr. Justice Eve again had before him a petition for the winding up of Parent Coal Carbonisation Trust, Ltd.

Mr. Buckmaster said he understood a cheque had been handed the petitioning creditor in payment of a portion of his claim and he was prepared to consent to allow the petition to stand over for the scheme put forward by the Company to go on.

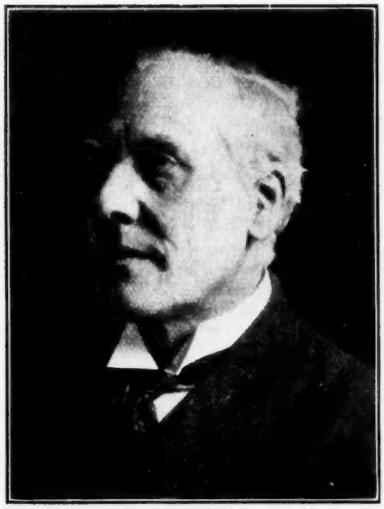
Mr. GRANT said the cheque was a private one and would be cleared in the ordinary way.

His LORDSHIP said if the cheque were duly cleared the matter could stand over.

The Birthday Honours List

Recipients Connected with Chemical Industry

AMONG the knighthoods conferred in the recent Birthday Honours List, the one of outstanding interest to readers of THE CHEMICAL AGE is possibly that of Sir Robert Henry Davis, governing director of Siebe, Gorman and Co., Ltd., the well-known submarine and safety engineers. It was just 50 years ago that Sir Robert, then 11 years old, entered the works of Siebe, Gorman and Co. Here he served successively under Henry Siebe (son of Augustus Siebe, who founded the firm in 1819, and invented the diving dress and helmet on the principle which is in universal use to-day) and Mr. W. A. Gorman. On the death of the latter he became managing director, and was associated with the late Albert Vickers, Sir Trevor Dawson, and Douglas and Vincent Vickers. The greater part of his working life has been spent in research and experimental work connected with deep sea diving and the hazards of irrespirable atmospheres such as are encountered in mines, chemical works and at fires. Among his many inventions are the "Proto" self-contained breathing apparatus for rescue work in mines (in collaboration with Henry A. Fleuss); the Davis submersible decompression system, which has greatly simplified the problem and risks of deep sea diving; and the Davis submerged escape apparatus which was instrumental in saving the lives of a number of the crew on the occasion of the disaster to H. M. Submarine "Poseidon" when in the China Seas last year. During the war Sir Robert rendered valuable service in experimental work on breathing apparatus for work in poisonous atmospheres.



Sir Robert H. Davis

Dr. Robert Ludwig Mond, who receives a knighthood for public services, is president of the Faraday Society, and a director of I.C.I. Alkali, Ltd., and the International Nickel Company of Canada. He was born at Farnworth, near Widnes, 1867, and is a son of the late Dr. Ludwig Mond and a brother of the late Lord Melchett. In 1929 he gave £8,000 to the French Institute of Chemistry, and in 1930 received the honorary degree of LL.D. from Liverpool University. The Infants' Hospital, Westminster, was erected by him as a memorial to his first wife, who died in 1905. He also bore the cost of the unique photographic equatorial at the Norman Lockyer Observatory, Sidmouth.

Mr. William John Firth, who also receives a knighthood, took a leading part in building up the existing organisation of the Welsh tinplate industry and is chairman and managing director of Richard Thomas and Co. He is also a director of the Associated and British Portland Cement Companies.

Among the names of the new baronets occurs that of Sir Charles Ernest Leonard Lyle, chairman of Tate and Lyle, Ltd., sugar refiners, Silvertown. He was Member of Parliament for the Stratford Division of West Ham, 1918-22, and for the Epping Division of Essex, 1923-24.

I.C.I. and the Economic Position

Sir Harry McGowan makes a Survey

IN a brief survey of the present industrial and economical position at the sixth annual meeting of the central council of the works council scheme of Imperial Chemical Industries, Ltd., reported in the June number of the "I. C. I. Magazins," Sir Harry McGowan, chairman, said the company's sales of heavy chemicals kept up wonderfully well in this country and its sales in the export markets were now on the upward move. As a whole, the company was doing well, in some groups particularly well, but he could not get rid of the knowledge that what it was doing now in excess of other countries and that until they saw a settlement of international financial problems they could not look with any great confidence to that prosperity continuing.

It was axiomatic that the rate of reduction of earnings of a manufacturing company was greater than the reduced volume because with reduced volume costs went up, but the costs of nearly every article they made, notwithstanding reduced volume, were less in 1931 than in 1930. That was a great tribute to their organisation; but every one must see that what they had done by way of increased efficiency did not slip from them. On the upward curve there was always a certain amount of carelessness which crept in, and that applied to every one, from the chairman down; but he looked to see that the economies they had made would be continued even against the time when they saw increased volume.

Lord Reading, president of the company, said that to all concerned in the company it must be a real satisfaction to note that they had during the last few months made strides forward, not as great as they should like, but nevertheless strides in advance. Nothing was more certain than that one nation was dependent on all other nations, and especially our nation, for trade throughout the world.

Chlorinated Rubber

A New Non-inflammable German Product

SNOW-WHITE, transparent, non-inflammable chlorinated rubber is on the market in Germany, where it is finding use particularly for painting iron, concrete and wood. These are no more expensive than the usual good paints and have better adhesive qualities. The Mannesmannwerke now produces about 10,000 kilos per month of a similar product known as "Tornesit" used for painting gas and water piping. Tornesit, containing 30 per cent. rubber, can be used for all articles hitherto made of ebonite or bakelite and may be obtained in all colours desired. Decomposition of chlorinated rubber begins at 150° C.; therefore it is suitable for impregnating fabrics, wood, etc. It is resistant to acids and alkalis, insulates against electricity, and gives special hardness to films. It has specific gravity 1.5, is soluble in Benzol, in esters and chlorin-hydrocarbons as well as in tetraline. It is insoluble in alcohols, benzine and mineral oils. Highly concentrated solutions readily absorb colours and, therefore have good colouring power. Plastic masses, artificial leather, etc., can be produced from chlorinated rubber. The products are cheap because the basic materials, rubber and chlorine, are at present low in price and available in practically unlimited quantity; while production is comparatively simple and inexpensive.

Chemical Matters in Parliament

Bromine Imports

IN the House of Commons on June 7, Major-General Sir Alfred Knox (Bucks, Wycombe) asked the President of the Board of Trade what amount of bromine had been imported into, and exported from, this country since May, 1931; and what proportion, if any, had been consigned to Germany or Russia.

Mr. Walter Runciman replied that during the 12 months ended April 30, 1932, the total imports of bromine and bromides into the United Kingdom amounted to 12,410 cwt., and the exports to 1,093 cwt. (including re-exports 664 cwt.). No exports of bromine or bromides were registered during this period as consigned to the Soviet Union, and the only consignments to Germany consisted of 5 cwt. re-exported.

Public Economy and Private Spending

The Road to Prosperity

AN exchange of letters in the columns of the "Times" raises questions of the highest importance not only to the individual citizen but to the entire business community which chiefly functions on the expectation of the proper use of his spending power. The issue, put simply, is whether economy should not be universally applied in the financial crisis through which the nation is passing. It is accepted as an axiom of national policy that the most drastic economies should be made in public expenditure, both Governmental and local. Does it not follow that severe retrenchment should be made in every private budget in the land? Dr. L. R. Phelps thinks that it should, and argues that what is sauce for the goose is sauce for the gosling. Dr. Phelps was led to put this point before the Editor of the "Times" by reading a passage from Sir Ernest Benn's speech at the recent City demonstration organised by the Friends of Economy. Sir Ernest Benn had suggested that "if we could achieve public economy and liberal private expenditure, we should soon again be back on the road to prosperity." Dr. Phelps challenged this doctrine and urged that the nation would be sooner back on the road to prosperity if all its citizens adopted more simple and thrifty standards of living.

A Vital Distinction

There is a vital distinction between public economy and private economy, and Sir Ernest Benn, in promptly taking up Dr. Phelp's challenge, has lifted the argument into an unassailable position. He points to the revolutionary change made in the last few years in the proportions of public and private affairs. Whereas in the lifetime of most of our readers public affairs cost 5 per cent. of the national income and private affairs accounted for the other 95 per cent., public affairs now absorb not less than one-third of our total resources and private affairs have been pared to the bone to permit of this extravagance. The case for public economy mainly rests therefore on the argument that this enormous transfer from the private to the public pocket is the prime cause of our economic distress and that the way to recovery is to reduce the proportion of our income which we pay into the public purse and leave more in the individual pockets of the people to spend or save as they themselves may decide. Sir Ernest Benn finds confirmation of his attitude in the lowering of the bankers' deposit rate to ½ per cent. and in the decision of the building societies to take no more deposits. The bankers and the building societies are saying, in effect, "Spend your money; don't save it."

The Wiser Spender

A sentence in Dr. Phelp's letter illuminates the difference between the two standpoints. He poses the question:—"Are not works of public utility on health and housing at least as productive and certainly more lasting than, let us say, banquets, dresses, and even in many cases motor cars?" Any reply has to take into account one of the most vital of all economic considerations—whether a public authority or a private citizen is the wiser spender. The individualism latent in the British character was undoubtedly responsible for the emphatic reply given at the last general election. The only possible interpretation to be placed on the vote of the huge majority which placed the National Government in power was that the worst place for money was in the hands of Government Departments and local authorities and the best place was in the pockets of individual citizens. That was a perfectly logical attitude in a commercially-minded people, as notoriously a man spends his hard-won earnings more effectively that a committee spends other people's money over which it has secured temporary control. For one thing, the individual knows exactly how far he can go along the only possible road open to him, that of personal solvency, whereas a public authority engaged on health and housing schemes has no compunction in raising countless millions by a system which places the ultimate burden on generations still unborn. That some confusion should have arisen in the public mind on the subject of the two branches of economy is not surprising. No greater public service could have been rendered at this time than the making of a determined attempt to clarify the arguments.

In any event, there is an obvious difference between wise spending and mere extravagance. The wilful abuse of money cannot be defended in any circumstances. But that is a very different thing from the excessive caution observable at the present time which is leading a great many people to hold up purchases of goods of which they stand in need, not for actual lack of money but from doubt of what the future has in store. A sudden contraction of the home market would be the worst thing that could happen during a period in which international trade is collapsing and special inducements are being held out to British manufacturers to cater increasingly for this very market. One of Sir Ernest Benn's strongest points is that the simplicity for which Dr. Phelps asks will not enable 45 million people to live 3½ to the acre on an island like ours and that the thrift for which he equally stands goes by the board when the bank will only give ½ per cent for it.

There is a final point of the possible danger of the carrying of private spending to excess. Once more the individualist British system steps in with the natural remedy. Whenever private spending reaches such a point as to endanger an adequate amount of thrift and saving, the bank rate will put it right. The argument seems wholly conclusive for the policy which aims at reserving more and more of the money now raised by taxation for public expenditure to fructify in the pockets of the people. The case for "business as usual" is at least as strong to-day as it was in the first weeks of the Great War. The British public, which has shown a remarkable absence of panic in the economic stress through which it has been passing, is now called upon for a characteristic display of courage or commonsense, whichever way one looks at it. It will not go wrong if it accepts as its prescription for 1932:—"Drastic public economy and liberal private spending."

The Institution of Gas Engineers

Mr. J. H. Canning's Presidential Address

THE 69th annual general meeting of the Institution of Gas Engineers was held at the Park Lane Hotel, London, on June 7, 8 and 9, under the presidency of Mr. J. Herbert Canning, engineer and manager of the Newport (Mon.) Gas Company. Mr. R. E. Gibson, engineer of the Liverpool Gas Company, was elected president for the ensuing year.

Mr. CANNING, in his presidential address, said the gas industry had not only survived the unexampled economic tempest and trade depression of the past twelve months, but had fully upheld its position, and even at a moment when Government securities were severely affected by world-wide uncertainty and apprehension, the stocks and shares of gas companies maintained their value in a manner unsurpassed by the securities of any other trade or industry. It was hoped that the darkest hour of depression was over and that we might shortly expect the serene dawn of prosperity. In that returning prosperity the gas industry would undoubtedly participate, but it must have complete freedom to trade, unfettered by unfair or illegal restrictions. A healthy public opinion was asserting itself and there was a better realisation both of the services which gas was rendering to the community at the present time and the possibilities of extending them in the future.

Referring to the research activities of the Institution, Mr. Canning said that as a result of the depreciation in the value of by-products, the Liquor Effluents and Ammonia Sub-Committee was devoting attention to the general question of the better recovery and utilisation of ammonia and its products. The research and technical committees and the Joint Research Committee of the Institution and Leeds University were continuing their investigations, under the direction of the General Research Committee. A recent development was the co-operation of the Institution with the research departments of the larger gas undertakings and of private laboratories. Valuable assistance had already been rendered.

Letters to the Editor

The Editor welcomes expression of opinion and fact from responsible persons for publication in these columns. Signed letters are, of course, preferred, but where a desire for anonymity is indicated this will invariably be respected. From time to time letters containing useful ideas and suggestions have been received, signed with a nom-de-plume and giving no information as to their origin. Correspondence cannot be published in THE CHEMICAL AGE unless its authorship is revealed to the Editor.

Visits to Works

To the Editor of THE CHEMICAL AGE.

SIR,—A recent leader in THE CHEMICAL AGE expressed the need for a pooling of knowledge for the mutual benefit of those engaged in the chemical industry. In no case is this pooling more essential than to lecturers in our universities and technical colleges, who can only keep up-to-date by constant visiting of works and discussions of industrial aspects with representatives of the concerns. Such visits are vital owing to the interval elapsing between changes in methods of manufacturing chemical products and the description of such changes in the text-books.

The majority of chemical manufacturers are extremely obliging in arranging for such works visits. They realise that they have nothing to lose but often something to gain by this contact between themselves and lecturers or representatives of other concerns, for a concern proud of the purity of its products will attain an enhanced reputation by showing its visitors a practical proof of the claims made in advertisements. It is to the minority that this letter is addressed. Do these realise that more facts are broadcasted in publications and in the patent literature than can be gained by a works visit? To take a viscose silk works as an example; in what way does the concern suffer by allowing a tour of inspection to be made by persons interested in the progress of chemical technology, but having no connection with other similar concerns? One can readily understand that, whereas a chocolate firm, or a brewery, may gain a lasting advertisement by conducting the public around its spotless premises, a silk concern would gain nothing in the way of popularising its fabrics by conducting the wearers of silk stockings through a viscose factory with its whiffs of H_2S at certain points. But representatives of other works or chemical lecturers are differently situated; they are seeking knowledge for its own worth; they are in search of neither the spectacular nor the curious —nor even the free tea and free sample which invariably follow the grand tour.

In the training of the younger chemist or employee in our technical colleges it would be ideal to have a series of visiting lecturers to give knowledge gained from actual experience. Since this ideal is difficult to attain, the next best thing is for the permanent lecturers of the colleges to visit all works and gain a first-hand outline. But they meet with a refusal in many cases on the grounds of secret processes. Why all this secrecy?—Yours faithfully,

"INQUIRER."

Professional Unity in the Chemical Industry

To the Editor of THE CHEMICAL AGE.

SIR,—Mr. Johnson's article on "Professional Unity in the Chemical Industry" raises a question which has been uppermost in the minds of a great many people for a great many years. Schemes in plenty have been suggested for bringing unity about. All of them have been admirable in theory; most of them quite unworkable in practice.

The advantage of Mr. Johnson's suggestions are clearly great. He does not envisage any particular interference with the constitution of the societies as they exist to-day, which is one of the essential points which has to be borne in mind. It is very difficult to believe that anyone could ever have supposed it was possible to combine the chemical societies into one vast and unwieldly whole, except on the theory—one quite tenable—that there are people who will believe anything. The British Association of Chemists, which has always tried to approach problems from a realistic point of view, has continuously advocated for many years a basic of unity, in principle similar to that which Mr. Johnson has elaborated with so much care and attention to the realities.

But many difficulties remain. The scheme is sound and practical, but there is at present no machinery to bring it into being, and we seem to be no nearer constructing that machinery than we were ten years ago when first the Association suggested that the profession required a General Chemical Council. To consider the reasons as to why this absolute essential step has been consistently shelved would perhaps be out of place at this stage, but it remains true that unless and until a conference takes place between all the principal chemical societies with the view to the formation of such a council, it is unfortunately of little practical use to consider ways and means. There is no evidence whatever that such a conference is even within measurable distance. Three years ago the Association officially approached other societies with a view to the consideration of this very question. The results have not been such as to encourage the council in the hope that there is really much interest in the matter.

A movement in this direction is, however, long overdue. With the exception of the Institute of Chemistry and the British Association, whose memberships have been growing steadily for a number of years, the membership of chemical societies is declining. The reason for this is unpalatable but quite obvious. A society whose functions are the publication of a journal—however good that journal may be—and holding of scientific meetings—however interesting—is not doing all that is required of any society. A society must have a policy and definite aims which it strives to carry out. This is clearly applicable to-day when there is a real danger of the extinction of the western civilisation unless science, and particularly chemical science, steps in to save it.

It is commonly and quite incorrectly said that the chemical man is not interested in such matters. This is grossly untrue. His difficulty is that he has not in the chemical societies who claim to represent him—and who do not?—an adequate mouthpiece by which to express himself. That is the strongest point of all in favour of a real professional unity brought about by the medium of a General Chemical Council. But a mere mechanical unity, an irrationalisation is of no use. Besides the machinery, we must also have the will to unite. We are at the moment a long way from achieving either.—Yours faithfully,

HENRY T. F. RHODES.
Editor of "The Chemical Practitioner."

British Association of Chemists,
175 Piccadilly, London, W.1.

Lead Poisoning Conquered

A Thing of the Past in Battery Manufacture

LEAD POISONING has been conquered, according to Mr. W. S. Naylor, chairman of the Chloride Electrical Storage Co., Ltd. Speaking at the ordinary general meeting at the Exide Works, Clifton Junction, near Manchester, on May 28, Mr. Naylor said that whilst sporadic cases of plumbism might occur from time to time, as the result of the medical research carried out at Clifton Junction, together with the comprehensive regulations issued by the Home Office, lead poisoning in their accumulator factories was practically a thing of the past. "The information we have collected from our research," he added, "is at the disposal of the accumulator trade, or any trade where the employees may be exposed to the risk of lead poisoning."

Referring to the company's export trade, Mr. Naylor said that a large section of the total had been affected by the low prices of primary products, the restrictions on foreign exchange transactions and by tariffs.

Their trading policy had for many years made importations of accumulators impracticable, but, on the other hand, some of their raw materials had been increased in price by the imposition of British tariffs, or the imposition, by the suppliers, of a premium on non-dutiable Empire materials. The only branch of the business which had benefited by the new tariffs was the manufacture of dry batteries.

Chilean Nitrate

Position of Cosach under New Government

APPREHENSION about the future of British and American investments in Chile centres round reports that the new Government plans to socialise the State on a scale hitherto never attempted in modern times except in Soviet Russia. It is reported that the Cosach nitrate combine is to be nationalised immediately, as part of the socialist scheme to seize "big business," but that Senor Davila, the head of the new Government, does not intend to confiscate other foreign property at present. With the dissolution of the Cosach combine, which has yet to materialise, it is the intention of the new Government to reopen small nitrate plants and reorganise nitrate sales, impose State monopolies of oil, tobacco, sugar, alcohol, bring about the gradual socialisation of credit, and impose an embargo on luxury imports such as silks and motor cars. The intention, expressed by the new Government, of reverting to the oldest nitrate oficinas because they are capable of providing more employment per quintal produced, is however, of such a nature that Chile could hardly be expected to bear with it for long.

British Capital in Chile

A large amount of British capital has been invested in Chile, the nominal amount of outstanding Chilean loans quoted in the Stock Exchange Official List being over £25,000,000. British investors are heavily interested in nitrate, the principal industry, and also in other enterprises. The Compania de Salitre de Chile ("Cosach") which was organised under a special Act of the Chilean Congress, was registered in 1931 to acquire the shares and assets of over 30 companies in order to reorganise the nitrate industry. It has an unauthorised capital of 3,000,000,000 gold pesos (£75,000,000), divided into 15,000,000 "A" shares of 100 gold pesos and 15,000,000 "B" shares of the same nominal value. All the "A" shares have been issued to the Chilean Government in part consideration of the Government's having granted to the company and its subsidiaries exemption from the export duty on nitrate, the right to obtain delivery for exploitation of Government nitrate deposits containing up to 150,000,000 metric tons of recoverable nitrate, and certain other concessions. It also has issued the equivalent of £10,368,129 of Prior Secured Seven per Cent. Bonds, £14,384,054 of Secured Sinking Fund Seven per Cent. Gold Bonds, and £16,366,999 of other funded debt (including that of subsidiaries).

The Anglo-South American Bank also has close associations with the Chilean nitrate industry, and it will be recalled that an arrangement was recently concluded with a group of banks, headed by the Bank of England, under which certain assets of the Anglo-South American Bank connected with the nitrate industry, amounting to over £7,500,000, were to be taken over by the group subject to a guarantee. The principal United States interests in Chile are in the nitrate combination controlled by the Guggenheims; the Anaconda and Kennecott Copper Companies' mines, which produce 96 per cent. of the copper mined in the Republic; the great iron-ore reserves of the Bethlehem Steel Corporation, from which as many as 1,600,000 tons of ore have been taken in a single year; and the electric light and power plants operated under a 90 years' lease by the American and Foreign Power Company.

According to the latest information from Chile, the new Government has decided to delay the confiscation of "Cosach," the nitrate combine, until the question has been studied by experts. This statement is reported to have been made by the new Finance Minister, Don Alfredo Larrique, who added that the decision about the future of the nitrate combine will probably be submitted to the new Congress, which is to meet in November.

Kelp Production in Norway

PRODUCTION of kelp ash in Norway during the first quarter of 1932 is reported reduced because of a scarcity of seaweed, resulting from offshore winds which prevailed during the season. Official export figures place total shipments during January and February at 115,200 kilos, as compared with 34,400 kilos during the like period of 1931.

National Iron and Steel Committee

Reorganisation of the Industry

THE Import Duties Advisory Committee met a number of representative iron and steel producers on June 3, by invitation of the Committee. Sir George May, who presided, read the following passage from the first report of the Committee: "We are satisfied that the maintenance of a prosperous iron and steel industry in the highest degree of efficiency is essential to the economic progress of this country, while from the point of view of national security it must still be regarded as vital. We accept therefore the preliminary proposition that this industry shall be adequately protected, and protected at once." That statement, he said, had been made deliberately with a full recognition of its import, and the further consideration which the Committee had given to the position of the industry had confirmed it in the opinion therein expressed.

Without a tariff or Government assistance of some description there had been every reason for pessimism as to the future of the industry, and a new position had now been created and the prospects of the industry were much brighter. But a tariff would not automatically solve all the problems with which those engaged in the industry were confronted. The industry could not be prosperous unless it could sell its products, and it could only sell its products if the industries using them were flourishing.

The Committee had decided to constitute a national committee to work out appropriate schemes with district subcommittees and a small executive committee. There would also be certain small committees for specialised sections of the industry. He requested Mr. Charles Mitchell, chairman and managing director of Dorman, Long and Co., to accept the chairmanship of the National Committee.

Sir William Larke, director of the National Federation of Iron and Steel Makers, consented to act as secretary to the National Committee, with Mr. M. S. Birkett, of that Federation, as assistant secretary.

Sir GEORGE MAY said that in recommending an additional temporary duty of 23⅓ per cent., making 33⅓ per cent. in all, on certain classes of heavy iron and steel products for a period of three months as an emergency measure the Committee had indicated that, if its inquiries had not been concluded and a more permanent scheme framed within that period, it would propose to recommend some extension. The Committee wished now to make it clear that should the present abnormal competition continue it would not hesitate to recommend a continuance of the present emergency duties for as long as necessary, and the industry could be assured that, provided they did their part, the permanent tariff to be recommended would be sufficient to achieve the object in view.

Members of National Committee

The membership of the National Committee is as follows: Mr. Charles Mitchell of Dorman, Long and Co., Ltd. (chairman); Mr. E. J. George (Consett Iron Co., Ltd.); Mr. A. N. McQuistan (Cargo Fleet and South Durham Iron Co., Ltd.); Mr. John Craig (Colvilles, Ltd.); Mr. A. K. McCosh (William Baird and Co., Ltd.); Mr. Walter Gray (Steel Company of Scotland, Ltd.); Mr. Andrew Gray (Lanarkshire Steel Co., Ltd.); Sir John Beale (Guest, Keen and Nettlefolds Co., Ltd.); Sir W. J. Firth (Richard Thomas and Co., Ltd.); Mr. Frank Rees (South Wales Siemens Steel Association and Llanelly Steel Co., Ltd.); Capt. R. S. Hilton (United Steel Co., Ltd.); Mr. F. Clements (Parkgate Iron and Steel Co., Ltd.); Mr. H. A. Davies (Patent Shaft and Axletree Co., Ltd.); Mr. J. E. James (Lancashire Steel Corporation, Ltd.); Mr. H. Summers (John Summers and Sons, Ltd.); Mr. A. C. Macdiarmid (Stewarts and Lloyds, Ltd.); Mr. E. J. Fox (Stanton Ironworks Co., Ltd.); Mr. G. H. Johnson (Kettering Iron and Coal Co., Ltd.); Mr. D. N. Turner (Staveley Iron Co., Ltd.); Mr. W. R. Lysaght (J. Lysaght, Ltd.); Major A. Hibbert (Millom and Askam Hematite Iron Co., Ltd.); Mr. J. Davison (Barrow Hematite Steel Co., Ltd.); Mr. A. J. Grant (National Federation of Iron and Steel Manufacturers, and Thos. Firth and John Brown, Ltd.). The secretary of the National Committee is Sir W. J. Larke, director of the National Federation of Iron and Steel Manufacturers. The assistant secretary is Mr. M. S. Birkett, secretary of the National Federation.

The Dyeing of Gloving Leathers

By D. WOODROFFE, M.Sc., A.I.C.
(Head of Leather Dept., Northampton Technical College)

GLOVING leathers are perhaps the most difficult of all the leathers which the leather dyer has to handle. There are three tannages available—alum, oil and formaldehyde. Most of the dyed gloving leathers, however, are alum leather, and this presents difficulties to the leather dyer which are shown by no other type of tannage. The leather is very susceptible to the action of water. The mere wetting and drying out of the leather is sufficient to cause it to dry out hard and horny, but if the skins are soaked in water, then a considerable portion of the tannage is removed, and the leather is actually pelted; subsequently, every time alum leather is wet or soaked, the tannage which has been washed out must be restored. Moreover, the leather does not dye readily or evenly, and the simple methods of dyeing practised on vegetable tanned leathers are totally inapplicable to the dyeing of alum tawed gloving leathers.

Use of Natural Dyestuffs

Because of the difficulties which have been presented by alum leather, the glove leather dyers of this country have always stuck to the old-fashioned method, involving the use of natural dyestuffs. This method is now known as the English method of glove leather dyeing, and the writer has recipes in his possession which involve the use of considerable amounts of different natural dyestuffs, some of which are quite foreign to other branches of the trade. Glove leathers can be readily dyed with these natural dyestuffs which go on the leather evenly, but they also plump the leather and impart a full, velvety feel, particularly suitable for suede finishes. Hitherto, grain gloving leathers have either been prepared in this country on chrome retanned alum tawed skins or they have been imported. Most of the fine nappa leathers have been imported, chiefly from France. These were brush dyed on the table, and the French proved experts in the manufacture of this dainty leather. The only method whereby coal tar dyestuffs have hitherto been employed on gloving leather in this country has been on chrome re-tanned skins. The chrome tanning imparted some of the properties of full chrome leather to the gloving skins and they could then be dyed in the same way as chrome sheep. Unfortunately, the chrome re-tanning destroyed to a large extent the characteristic properties of the leather, particularly the stretch of the peculiar grain which is possessed by a straight, alum leather. Chrome re-tanned gloving leathers have usually possessed a rather plump feel which was quite different from the appearance of the real nappa leather.

A new type of coal tar dyestuff was discovered a few years ago which consisted of chromium compounds instead of the usual sodium salts, and it has been found that these dyestuffs are particularly suitable for the dyeing of alum leathers. Instead of having to chrome re-tan the alum leather, and thus destroy or spoil its characteristic properties, these dyestuffs containing the chromium as part of the dyestuff molecule, will dye the alum leather without any pre-treatment which might impair its take and unique character. They can be applied in the drum or on the table by means of a brush. Dyestuffs of this type are Neolan, Erganon, Palatine and Eriochrome colours. Some of them are very suitable for pale shades on any kind of leather, but as they are slightly more expensive than the ordinary acid dyestuffs, their use must necessarily be confined to better classes of leather, and the glove leathers in particular.

Preparation of the Leather

In preparing the leather for these new dyestuffs the skins are first drummed in warm water at 25 to 30° C. for 45 minutes, the drum making 14 to 16 revolutions per minute. Then 1 per cent. ammonia (20 per cent.) is added and the revolving of the drum is continued for a further period of 30 minutes. The skins should then be completely "wet back" by this treatment, and there should be no white spots or unsoaked portions evident. The leather is subsequently re-egged with ¾ to 1 oz. of egg yolk per skin. The skins are next struck out on the table and brushed over with a solution of 1 per cent. of ammonium carbonate. This is followed by a ½ per cent. solution of the dyestuff, the dye solution being brushed over and padded into the grain of the leather 3 or 4 times until the necessary depth of colour is produced. For the purpose of dyeing the skins in the drum the leather is wet back with the weak ammonia solution as before, and then drummed for ten minutes with 1 per cent. of bichromate followed by 5 per cent. of chrome tanning extract (solid) 10 per cent. liquid added in two lots and the leather drummed with the salts for one hour. At the end of the tanning period the leather should be drummed in fresh water for 10 minutes, which acts as a wash and partial neutralisation. The dyes are then applied in a dye-bath containing 600 to 800 per cent. of water and a small amount of synthetic tannin (3 per cent.) is recommended in order to restrain the dyeing. After 10 minutes with this, the dyestuff solution is added in five portions, the first three at intervals of 10 minutes each, the other two at intervals of half an hour. The leather is allowed to drum with the solution for another hour, then rinsed and re-egged with ¾ oz. of egg yolk per skin in water 145 to 150° C. After the skins have been fat liquored, they are struck out, folded down the middle of the back, flesh inwards and dried out as quickly as possible. The leather is then conditioned in saw-dust and well staked, tested with French chalk and polished on the grain.

Imitation Nappa Leather

For some time an imitation nappa leather has been made from East Indian sheep skins which have been semi-chromed and dyed in the usual way. When first these were offered to the glove leather people, they complained that the skins were harsh and possessed of a peculiar squeak which was not helpful in marketing gloves made from them. Considerable improvements have been made, however, in the dressing, dyeing, and finishing of these imitation nappa leathers from E.I. sheep, and the process has been so far perfected that it is very difficult nowadays for the public to distinguish between real nappa and the imitation product. The leather possesses stretch and the soft, glove-like character which is so necessary. The application of the chrome dyes mentioned above has enabled the palest shades to be obtained on these leathers, and improvements in finishing, the perfecting of the pigment finishes, and more recently still, the greatly improved character of the cellulose finishes has enabled the leather manufacturers to produce very beautiful results.

The Fading of Dyes and Lakes

Molecular Re-arrangement

THE theories which have been proposed from time to time to explain the fading action of light are reviewed by J. W. Ackerman in the "Journal of Physical Chemistry," 1932, *36*, 780. In order to determine whether dyes can fade in the absence of oxygen, nitrogen was bubbled through a solution of Methyl Violet in water and this solution when exposed to the Fadeometer faded in 28 hours, whilst a control solution not so treated with nitrogen faded in 35 hours. Thus some basics fade in the absence of air. A similar result was obtained with Methylene Blue, while Acid Green and Alkali Blue solutions actually faded more in the oxygen-free solution. "This," the author states, "is probably due to a rearrangement of the molecules." The greater fading of Indigo on cotton as compared with wool is explained as due to the greater "chemical potential" of the dye on cotton, which quantity is simply the saturation of the dye (ratio amount absorbed in given solution to maximum absorption). For a given weight of dye per gram of cloth, cotton has a greater saturation than wool, because the maximum absorption on cotton is less. The factors which control fading and and some light sources are then briefly reviewed. The fading of a given colour lake is shown to be less on coloured than on colourless mordants, due to the light faltering action of the former. Fustic on tin gives a yellow which is fugitive, whilst the yellow on chromium is fairly fast; the explanation given is again the difference in "chemical potential."

New Dyestuffs

The Editor will be pleased to receive particulars of new dyestuffs for notice in this column, as and when such dyestuffs become commercially available.

DIPHENYL Fast Blue Green BL, introduced by the Geigy Colour Co., Ltd., of Manchester, is an excellent direct dyeing dyestuff for cotton and artificial silk, which yields clear unrivalled blue-green shades of unequalled fastness to light. This colour is characterised by its remarkable level dyeing properties, exceptional solubility and fastness to alkali, very good fastness to acids, rubbing, calendering, sea water, perspiration, stoving, sulphite and vulcanising; it is also of comparatively good fastness to water and washing, besides giving a remarkable shade in artificial light. As a dyestuff it should find application where it is desired to obtain the highest fastness to light, good fastness to water, acids and perspiration on cotton and artificial silk of every kind (with the exception of acetate silk). It can be used not only as a self colour but is also recommended as the blue component for greys and mode shades where excellent fastness to light is essential. On mixed fabrics of cotton and viscose or cotton and cuprammonium silk it gives by appropriate dyeing methods shades of good solidity, and on account of its good dischargeability is can be used for all classes of discharge work. In dyeing fabrics of cotton and wool, or cotton and silk, the animal fibre in each case is left white or only slightly stained according to the method of dyeing. In combination with bright, fast to light direct yellows it is possible to obtain greens of unsurpassed beauty and brightness having the highest degree of fastness to light.

* * *

DIPHENYL Brilliant Violet 3B, another production of the Geigy Colour Co., forms a further addition to their range of Diphenyl Brilliant Violets, being bluer in tone. This new product is distinguished from the older B and 2R brands by the remarkably clear, pure bluish violet shade and has the same good fastness properties. In fastness to light it is appreciably superior to both the two older brands, and by after treatment with copper sulphate the fastness to light is still further improved. It is suitable for the production of clear violet tones not only as a self colour but also in combination shades for cotton and all kinds of artificial silk (with the exception of acetate silk), and mixed fabrics of cotton and artificial silk.

Artificial Dye Exhibition

Seventy-Five Years Development

IN connection with the jubilee celebrations of the Science Musum, South Kensington, a comprehensive exhibit showing the state of the artificial dyestuffs industry in 1857 and at the present day will be on view to the public from the beginning of July and will probably remain open for several months.

The exhibits have been arranged to cover as wide a field as possible and, in addition to specimens representing the various clases of dyestuff, include methods of manufacture, commencing from the coal tar stage, objects showing the properties of dyes, and a large selection of exhibits covering the various applications to textile fabrics, plastics, leather and other goods.

The printing of fabrics will be illustrated by a model three-colour printing machine in conjunction with illuminated transparencies of plant and a collection of printed fabrics. Exhibits of plain-coloured fabrics will be enhanced by the inclusion of specimens of the dyes actually used for producing each colour. The manufacture of coloured casein products will be shown in all its stages, while a series of scientific exhibits will show the range of colour which can now be obtained from the different classes of dyestuff.

The exhibits are being brought together with the aid of several well-known chemical firms and authorities, and represent an attempt to show the remarkable development of artificial dyes during the seventy-five years that have elapsed since the discovery of the first artificial dye ("mauve") by W. H. Perkin in 1856. Some of Perkin's original specimens will be on view, while other historical exhibits will include a model of a natural indigo factory and a series of specimens of natural dyes with examples of the colours produced on various materials.

Textile Softeners

Measurement of Softening Effect

A METHOD of measuring the softening effect of softeners was recently described by O. Mecheels in "Textilberichte," 1932, *13*, 77. This method involves the measurement of surface friction and the compressibility of the textile material. In measuring surface friction, a thread is drawn over a number of fixed glass rollers and either the load in grams required to make the thread just slip is determined or the number of seconds required for a weight attached to one end of the thread to fall a distance of 2 m. is measured. The former method is used for rayon and the latter for cotton. In the measurement of compressibility, thread thickness is measured on an ordinary thickness tester, the thread being tensioned with a load of 1 g. This measurement shows that the different softeners affect the thickness quite differently. Many softeners which have their prototype in soap accumulate in every pore of the thread, making it feel fuller, heavier and thicker. Others, for example, Turkey red oil, increase the thickness without fulling the thread. The diameter of the yarn under compression is then determined with a cloth thickness tester, the difference between this value and the original thickness giving the compressibility of the yarn Softness curves for four typical softeners, namely, a lecithin-containing agent, a soap-like agent, a soap, and Turkey red oil on cuprammonium rayon and on an Egyptian cotton yarn are given by the author.

Desulphurising Viscose Rayon

Features of Various Agents Available

THE elimination of sulphur from viscose rayon is dealt with in a paper by Z. Kawata, which appears in the "Journal of the Cellulose Institute, Tokyo," 1932, *8*, (5). Treatment with sodium sulphide solution, containing 1 per cent. or more of glucose or 3 per cent. of glycerin, is efficient and the rayon thus treated is of good softness. The addition of ammonium chloride to the sodium sulphide solution serves to protect the rayon from damage by alkali, but makes the elimination of sulphur incomplete. Sodium sulphide solution (3-4 per cent.) may be used for desulphurising at 65-70° for a period of 10 minutes. The volume of the bath should be 20 times that of the sample with a 3 per cent. solution, and 10 times that of the sample for a 4 per cent. solution. Sodium sulphite does not damage rayon but its desulphurising action is weaker than that of sodium sulphide. Sodium hydroxide solutions containing 25-30 g. per litre may be used at 50° or higher temperatures but have an injurious action on the rayon. The presence of hemicellulose reduces the injurious effect. Sodium hydroxide solution containing a small amount of sodium sulphide is efficient and harmless. A solution containing 5-10 g. per litre of sodium sulphide and 25-30 g. per litre of sodium hydroxide gives the best results, if used at 50° C. for 15 minutes. The volume of the bath should be 30 times that of the sample. If the waste alkali from alkali-cellulose preparation is used for the sodium hydroxide, the process is said to be very economical.

Weighting Processes

Lead as Alternative to Tin

BELIEVING that a process featuring lead weighting is superior to the established tin weighting process, the United Piece Dye Works in the United States has acquired the exclusive right to use the patented method controlled by Max Imhof and Olab Berg, of the Imhof-Berg Silk Dyeing Co. Lead or salts of lead, described as insoluble, constitute the most important element of this new process, which is said to create a satisfactory maintenance of strength of fibre and fabric over an extended period. The process, according to Olav Berg, is ideally suited to insure elasticity, tensile strength and durability, which he considers the three fundamental requisites of a finished silk or rayon fabric. In surveying the market, the United Piece Dye Works has found that the new process is regarded with favour and that a strong demand for it is expected to develop, due to the advantages that it has over the tin weighting processes, such as the fact that lead weighting produces a softer, as well as a stronger fabric, while retaining the desirable effects of tin weighting.

News from the Allied Industries

Dye Products

SHAREHOLDERS of British Tintex and Dye Products, Ltd., at an extraordinary meeting to be held on June 30, will be asked to agree to a reduction of capital by means of a writing off of 4s. 6d. per 5s. share.

Match Industry

A MORATORIUM up to the end of August was granted to the Swedish Match Co. (a Kreuger concern) at an extraordinary meeting of the Swedish Cabinet in Stockholm this week. The company emphasised that some time is still required for the elaboration of a plan of reconstruction which will assure its future existence.

Leather

DR LOUIS MEUNIER, professor of industrial chemistry in the faculty of science, Lyon University, has been presented with the Gold Medal of the International Society of Leather Trades' Chemists, in recognition of his researches in leather and colloid chemistry. The presentation was made by Mr. F. C. Thompson, of Leeds University, at a meeting of the French Section of the Society held on May 14 in Paris. Mr. Thompson is president of the Society for 1932-33.

Soap Manufacture

WRIGHT, LAYMAN AND UMNEY, LTD., the proprietors of Wright's coal tar soap, will make an issue of 280,000, 7 per cent. cumulative preference £1 shares on Monday, June 13. The new title of the company is to be Wright, Layman and Umney (1932), Ltd. The original company was founded in 1849, and Wright's coal tar soap was first introduced about 1860. The profits of the vendor company have shown progressive increase during the past three years, and it is believed that the results for 1932 will be no less satisfactory.

Safety Glass

IT IS ANNOUNCED that the directors of Triplex Safety Glass, Ltd., recommend a reduction of the capital to £200,000 by a return of capital of 10s. per share. Triplex Safety Glass, Ltd., was registered in 1922 and made a public company in 1925. It has an authorised and issued capital of £400,000 in £1 shares. In the year to June 30, 1931, it paid a dividend of 10 per cent. and carried forward £33,600.

THE VOLUNTARY LIQUIDATION of the Newtex Safety Glass Co., Ltd., was sanctioned at an extraordinary meeting of the company held on June 7. Major Mein, who presided, said that Splintex Safety Glass, Ltd., had made a definite offer for purchase of assets; it was, however, considered too low, and certain matters connected with it might have to be referred to arbitration. It had been clear for a long time that there would be no distribution on the Deferred shares.

Mineral Oil

THE INTERNATIONAL PETROLEUM CONFERENCE at New York has failed to reach an agreement regarding the regulation of oil outputs, and there is no likelihood of a resumption of negotiations. It is unofficially reported, however, that some basis has been laid for an agreement among the national groups and individual cartels in connection with foreign markets which may be negotiated later in Europe. The Russians wanted to limit any formal agreement to three years, whereas others desired a ten-year agreement. They also refused to curtail future shipments to the 1931 level, and also refused to give up their distributing facilities located chiefly in Germany, England and Spain. The outside oil groups had offered to purchase all Soviet exports based on 1931 shipments, and as a final proposal were willing to let the Russians keep their present contracts and outlets abroad and to guarantee to balance up to 1931 exports, but the Russians also wanted a guarantee to cover all oil now sold on contract. Interviewed before embarking in the "Majestic" for England, Mr. J. B. A. Kessler, a managing director of the Royal Dutch Co., said that although not a success, the conference would prove a constructive influence for the future. He ascribed the failure of the conference chiefly to the excessively high prices demanded by the Russians for their petroleum in foreign markets.

Paper Industry

SPICERS, the papermakers and stationers, submit satisfactory results for the year to March 31. The gross profit from all sources, including an unstated amount for losses on exchange, is £298,980, compared with £306,770, which did not indicate any exchange loss. There is no debenture interest charge this time, and with some £15,200 saved on administration, the net profit comes out at £152,830, or £5,430 more than a year ago. Further progress has been made with redemption of the 5½ per cent. note issue, and the directors propose £20,000 for transfer to reserve against contingencies.

Cement

THE INDIAN CEMENT INDUSTRY shows continuous progress. The total consumption of cement in 1930 was 631,000 tons, as compared with 635,000 tons in 1929, but it is interesting to note that the consumption of Indian-manufactured cement increased in 1930 by more than 3,000 tons while the imports dropped by 7,000 tons. The Cement Marketing Company of India, Ltd., which was formed last year by eight of the ten manufacturing companies is now responsible for their entire sale and has at its disposal 722,000 tons per annum. Since the formation of this company, reductions up to Rs.4 per ton have been effected in the cost of cement. Imports of cement in the year 1931-32 amounted to 87,000 tons, as against 112,000 tons in the previous year. Imports from the United Kingdom declined from 63,000 to 45,000 tons.

China Clay

THE CHINA CLAY WORKERS have just received their first pay at the reduced rate of 11d. per hour in accordance with the decision arrived at by the china clay producers, beginning from May 16, 1932. It was reported at a recent meeting of china clay producers that the reduction in the wages of the workmen had been accepted without hostility. Communications have, however, passed between the trade union and the Federation of British China Clay Producers pointing out that the Federation had no power to deal with the subject of wages—but in view of the fact that it had been generally adopted, the question as regards that decision of the employers could not then be re-opened. Representations were made to the newly-formed China Clay Producers' Federation now that the legal formalities in connection with its establishment had been completed, to act in all matters affecting the trade wages and working conditions in the industry in the future. A resolution of the producers "that this general meeting having unanimously approved that the British China Clay Producers' Federation, Ltd., should act for the trade in all matters pertaining to hours and wages," recommended their chairman, Mr. W. Prescott, of London, should interview Mr. A. Dalgleish, the national secretary of the Transport and General Workers Union, and indicate to him the position of the Federation. The chairman promised to do his best to further the best interests of the trade and he hoped that he would secure the support of every china clay producer.

SKYNNER AND HIGSON, the china clay merchants at Sanstell have just acquired the whole of the china clay works at Hawkstor in the parish of Blisland together with the drying kilns and tanks at Newbridge, Bodmin Road, formerly in possession of the Onslow China Clays, Ltd. To have embarked upon such a scheme in the present condition of the industry undoubtedly displays a remarkable confidence in the future restoration of trade and also that commercial adroitness and courage that is so much needed in many of our industries. The works at Hawkstor are well equipped in every phase of china clay production together with an inexhaustible bed of good clay. The re-opening of these works will be hailed with considerable satisfaction as it is hoped that considerable employment will be found. Skynner and Higson have also acquired the works formerly in possession of the Fraddon China Clay Co. which are near Fraddon in the parish of St. Enoder. Here much of the machinery had been dismantled but the new proprietors are showing their characteristic and enterprising spirit in its re-instalment. These works are situate in a good china clay zone and have a capacity for 6,000 tons per annum.

Some Recent Dyestuff Patents

Dispersible Vat Dyes

READILY dispersible vat dye preparations are made by incorporating the dyestuff with a sulphonation product of abietene or abietine, which may be obtained from abietic acid, abietyl chloride, or material containing abietic acid, *e.g.*, rosin, by pyrogenetic decomposition and sulphonation, according to Specification No. 368,294, of the Newport Chemical Corporation, Carrollville, Wisconsin, U.S.A. Preparations from Anthrene jade green, Anthrene blue GCD, and Anthrene golden orange G are described in examples.

Waterproofing and Dyeing

DYESTUFF preparations are obtained by incorporating a vat dyestuff with an insoluble metal soap and an organic liquid to form a solution or colloidal solution, the vat-dyestuff, insoluble metal soap and any other ingredient being substantially dry before incorporation with the organic liquid, according to Specification No. 367,864 of Imperial Chemical Industries, Ltd., and A. D. Nicholson, 4 Blythswood Square, Glasgow. The insoluble metal soaps include calcium, magnesium, aluminium, copper, zinc, lead and nickel salts of fatty acids containing eight or more carbon atoms in the molecule, such as oleic, stearic, palmitic, erucic, lauric, and rosin acids. The vat colour may be incorporated with the insoluble metal soap prior to the treatment with an organic liquid; this may be effected by admixture in the molten condition, or by adding the colour during the formation of the soap or during the preparation of one of the starting materials for the formation of the soap. The preparations can be used for dyeing and waterproofing materials, such as textiles, canvas, rexines and leathers, and for incorporation in oil, wax, spirit, etc. In one example aluminium sulphate and Caledon Jade Green are added to an aqueous soap solution and the precipitated curds separated and dried; the product is dissolved in an organic liquid such as petroleum ether; alternatively the colour paste of Caledon Jade Green is added directly to molten aluminium stearate to give a product suitable for solution in the organic liquid. In another example, a mixture of an equeous suspension of aluminium hydroxide and Caledon Blue 3G paste is heated with palmitic acid, and is water expressed from the product, when the dry product is in a suitable form for dissolving in an organic liquid.

Fast Prints on Cellulose

ACCORDING to Specification No. 368,240, of Durend and Huguenin Akt.-Ges., Basle, Switzerland (which specification is void, but published under Section 91 of the Patents and Designs Acts) fast prints are obtained on celulose ester fabrics by the use of a printing colour containing a substance of the urea group, *e.g.*, urea, thiourea, or guanidine. Acetate silk is printed with an aqueous preparation containing Blue 1900 double, urea, British gum, gum, and turpentine, dried, steamed for one hour, and washed; the dyestuff may be replaced by Violet modern A, Modern grey PS, Phenocyanine TV, Modern azurine 5G, Chromacetine blue S, Modern yellow, or Modern hediotrope DH, and the urea by thiourea. Alternatively, acetate silk is printed with an aqueous paste containing Chromorhodine BB, guanidine, carbonate, British gum, gum, and turpentine, dried, steamed for one hour, and washed.

Wetting Agents

SULPHONATION products of abietene, abietine, and abietane are used as wetting agents in Specification No. 368,293, of the Newport Chemical Corporation, of Carrollville, Wisconsin, U.S.A. Abietene and abietine are obtained by pyrogenic decomposition of rosin, abietic acid or abietyl chloride, *e.g.*, by refluxing rosin in the presence of iron, until its acidity is practically destroyed, and then submitting the product to distillation. Abietane is obtained by hydrogenation of abietene in the presence of nickel. The sulphonation may be effected with sulphuric acid monohydrate. Cotton yarn is wetted out with an aqueous solution of abietene sulphonic acid (sodium salt) and dyed with Anthrene violet BNX in a vat in the usual manner; alternatively the abietene sulphonic acid may be added to the vat. Woollen yarn is wetted with a solution of abietene sulphonic acid as a step in any process involving the wet treatment of wool, *e.g.*, cleansing, degreasing, dyeing, fulling or carbonising. Cellulose acetate silk is dyed in a bath prepared from a mixture of 1-amino-2-methylanthraquinone, sugar, and abietene sulphonic acid (sodium salt).

Dibenzanthrone Dyes

DIBENZANTHRONE dyes, described in Specification No. 368,315 (Newport Chemical Corporation, Carrollville, Wisconsin, U.S.A.), are made by etherifying Bz2 : Bz2^1-dihydroxy- or Bz2-hydroxy-Bz2^1 alkoxy-dibenzanthrones with an alkylating agent of the general formula Y-CH_2-CH_2-X-CH_2-CH_2-Z, where X is an oxygen atom or imino group, and where Y and Z both represent strong acid residues, *e.g.*, chlorine, bromine, sulphate or arylsulphonate, or one of them represents a strong acid residue, while the other represents an alkoxyl group. In cases where products containing free hydroxyl groups are formed, the fastness to acid may be increased by further alkylation, *e.g.*, by methylation. The products dye in green shades, the dyeings being in many cases substantially yellower in shade than those from Bz2 : Bz2^1-dimethoxdibenzanthrone.

Azo Dyes

AZO dyes are made in substance or on the fibre by coupling an arylamide of 2-hydroxyanthracene-3-carboxylic acid with a diazo compound containing no sulphonic, carboxylic, or other solubilising group, as described in Specification No. 367,907 (A. Carpmael, London, a communication from I. G. Farbenindustrie). In examples the following dyestuffs are produced on cotton: (1) 4-amino-4^1-methoxydiphenylamine —→ the anilide (dark green), (2) 1-amino-4-benzoylamine-2 : 5-diethoxylbenzene —→ the *o*-toluidide (blueish-green), (3) 5-chlor-2-toluidine —→ the *o*-toluidide (reddish violet), (4) 4-nitrobenzezneazo-aminohydroquinone-dimethylether —→ the *o*-anisidide (greenish black). (5) The preparation of the dyestuff of (2) in substance is described; a greenish blue powder is obtained which may be used as a pigment dyestuff for the manufacture of lacquers.

Improvement of Wetting Properties

ALKALI lyes which are used for treating natural and artificial cellulosic fibres have their wetting properties increased by adding a mixture of phenols with nitrogen-containing organic bases, *e.g.*, commercial cresols mixed with aniline, triethanol amine, phenyl trimethyl ammonium methyl sulphate, and pyridine, according to Specification No. 364,844 of Chemische Fabrik vorm. Sandoz, Basle, Switzerland.

Dyes and Intermediates

DYES for cellulose esters and ethers are the subject matter of Specification No. 365,165 of Imperial Chemical Industries, Ltd., W. Smith and R. F. Thomson, Earl's Road, Grangemouth. 4^1-Fluoro-benzoyl benzoic acid is nitrated with nitric acid or nitric and sulphuric acids to obtain a 3^1-nitro derivative which is reduced with iron dust and acetic acid, and ringclosed with sulphuric acid to obtain a mixture of 2-amino-3-fluoro- and 1-amino-2-fluoro-anthraquinone which may be fractionally separated.

Iron Oxide in Liquid Steel

New Method of Determination

A METHOD of determining the iron oxide content of liquid steel is described in Report of Investigations, No. 3166, issued by the United States Bureau of Mines. The method consists of adding aluminium to steel in a test spoon, pouring the killed steel into a suitable mould, and analysing the metal for Al_2O_3, from which the FeO in the steel may be calculated. When the metal has been deoxidised with manganese or silicon, the silica is reduced to about 0.006 per cent., and it would therefore be expected that almost all of the MnO would be reduced. The true FeO content is therefore not determined. If the electrolytic method is used in conjunction with the aluminium method, it is possible to correct for SiO_2 and MnO. It is important to remove all the slag from the surface of the steel in the test spoon. A reduction of manganese and phosphorus may take place from the slag on the metal if it has not been completely removed. There is no reduction of manganese or phosphorus from the slag which is used to coat the spoon.

Inventions in the Chemical Industry

Specifications Accepted and Applications for Patents

THE following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Specifications Accepted with Date of Acceptance

PREPARATIONS FOR THE TREATMENT OF FIBROUS MATERIALS. J. Y. Johnson (*I. G. Farbenindustrie*). Nov. 14, 1930. 373,233.

PROCESS FOR REMOVING PARAFFIN WAX FROM HYDROCARBON OILS. Edeleanu-Ges. Nov. 4, 1930. 373,538.

PROCESS FOR PRODUCING WHITE AND COLOURED RESERVES UNDER ANILINE BLACK. Soc. of Chemical Industry in Basle. Jan. 14, 1931. 373,558.

RETORTS FOR THE DRYING AND/OR THE DISTILLATION OF BITUMINOUS AND OTHER SIMILAR MATERIALS. Nesfield Retorts, Ltd., and A. G. Nesfield. Feb. 14, 1931. 373,644.

MANUFACTURE OF HYDROXYTHIONAPHTHENES OF THE NAPHTHALENE SERIES AND OF DYESTUFFS DERIVED THEREFROM. A. Carpmael. (*I. G. Farbenindustrie*). Feb. 17, 1931. 373,601.

PRODUCTION OF EFFECTS ON MATERIALS MADE OF OR CONTAINING ORGANIC DERIVATIVES OF CELLULOSE. British Celanese, Ltd., J. Allan and G. H. Ellis. Feb. 19, 1931. 373,653.

COLOURATION OF TEXTILE MATERIALS MADE OF OR CONTAINING CELLULOSE ESTERS OR ETHERS. British Celanese, Ltd. (*Celanese Corporation of America*). Feb. 20, 1931. 373,628.

MANUFACTURE OF NITRO-AMINO-DIPHENYL DERIVATIVES. Imperial Chemical Industries, Ltd., S. Coffey, and K. W. Palmer. March 2, 1931. 373,664.

AZO-DYESTUFFS. Williams (Hounslow), Ltd., and H. Ackroyd. Mar. 13, 1931. 373,689.

PROCESS FOR THE MANUFACTURE OF HYDROGEN AND CARBON MONOXIDE FROM HYDROCARBON GASES. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. Mar. 24, 1930. 373,701.

PROCESS OF MANUFACTURE OF PLASTIC SUBSTANCES THE BASES OF WHICH ARE CELLULOSE DERIVITIVES. G. B. Ellis (*Soc. des Usines Chimiques Rhone-Poulenc*). Mar. 23, 1931. 373,704.

ALLOYS CONTAINING TANTALUM CARBIDE. Fansteel Products Co., Inc. Mar. 26, 1930. 373,708.

PROCESS FOR THE MANUFACTURE OF ORGANIC COMPOUNDS CONTAINING THE SULPHHYDRYL GROUP. Schering-Kahlbaum Akt.-Ges. May 10, 1930. 373,755.

MANUFACTURE AND PRODUCTION OF CANDLES. J. Y. Johnson (*I. G. Farbenindustrie*). June 20, 1931. 373,806.

PROCESS FOR TRANSFORMING ALIPHATIC HYDROCARBONS INTO HIGHER HYDROCARBONS. Ruhrchemie Akt.-Ges. July 5, 1930. 373,822.

PROCESS OF HARDENING GELATINE. I. G. Farbenindustrie. July 11, 1930. 373,829.

MANUFACTURE OF REFRACTORY PRODUCTS. Metallges, Akt.-Ges. Aug. 6, 1930. 373,846.

PHOTOGRAPHIC BLEACHING-OUT PROCESS. I. G. Farbenindustrie. Aug. 13, 1930. 373,858.

MANUFACTURE OF ACETALDEHYDE, ACETONE, AND ACETIC ACID. Consortium für Elektrochemische Industrie Ges. Sept. 27, 1930. 373,893.

PROCESS FOR THE MANUFACTURE OF ALKYL DERIVATIVES OF CRESOL ETHERS. Schering-Kahlbaum Akt.-Ges. Sept. 30, 1930. 373,896.

METHOD OF AND APPARATUS FOR WASHING A LIQUID WITH ANOTHER LIQUID. Standard Oil Development Co. Oct. 20, 1930. 373,897.

PROCESS FOR ELIMINATING EASILY CONDENSABLE ELEMENTS FROM GASES. T. F. Hargreaves. Oct. 24, 1931. 373,918.

Specifications open to Public Inspection

PERFUMES, COSMETICS, PERFUMED SOAPS, ESSENCES, AND ANALOGOUS PREPARATIONS. Howards and Sons, Ltd. May 30, 1931. 1479/32.

MANUFACTURE OF PURE CARBONIC ACID. Bozel-Maletra Soc. Industrielle de Produits Chimiques. May 28, 1931. 9205/32.

METHODS OF PREPARING HALOGEN SUBSTITUTED BUTADIENES. E. I. Du Pont de Nemours and Co. May 26, 1931. 13561/32.

PRODUCTION OF OXIDIC LAYERS ON ALUMINIUM ALLOYS, AND OBJECTS CONSTRUCTED THEREOF. Vereinigte Aluminium-Werke Akt.-Ges. May 26, 1931. 13618/32.

PROCESS FOR THE PRODUCTION OF BERYLLIUM ALLOYS OF THE HEAVY METALS. I. G. Farbenindustrie. May 28, 1931. 13739/32.

NICKEL ALLOYS AND METHOD FOR THE PRODUCTION OF SAME. Siemens and Halske Akt.-Ges. Oct. 21, 1930. 14771/32.

METHOD FOR PRODUCTION OF TRIMETHYLENETRINITRAMINE. Dinamite Nobel-Soc. Anon. Italiana. May 27, 1931. 14855/32.

DYEING OF CELLULOSE ESTERS AND ETHERS. I. G. Farbenindustrie. May 26, 1931. 14872/32.

MANUFACTURE OF DYESTUFFS. I. G. Farbenindustrie. May 26, 1931. 14988/32.

DISINFECTANTS, FUNGICIDES, BACTERICIDES, AND THE LIKE. E. I. Du Pont de Nemours and Co. May 26, 1031. 15022/32.

DYESTUFFS AND THEIR APPLICATION. Soc. of Chemical Industry in Basle. May 28, 1931. 15130/32.

PURIFYING ZINC VAPOUR. New Jersey Zinc Co. May 28, 1931. 15151/32.

PRODUCTION OF ALIPHATIC ETHERS. E. I. Du Pont de Nemours and Co. May 28, 1931. 15294/32.

MANUFACTURE OF SULPHURIC ACID ESTERS OF ALIPHATIC AND ALICYCLIC ALCOHOLS. Soc. of Chemical Industry in Basle. May 29, 1931. 14325/32.

PROCESS FOR DE-SULPHURISATION OF GASES AND VAPOURS. Dr. H. Rostin. May 29, 1931. 15243/32.

Amended Specifications Published

MANUFACTURE OF CELLULOSE ESTERS. I. G. Farbenindustrie. 303,006.

Applications for Patents

DEOXIDATION OF PHENOLIC COMPOUNDS. R. N. B. D. Bruce, Gas Light and Coke Co., and R. H. Griffith. May 26. 14993.

DECOMPOSITION OF COMPLEX SALTS COMPOSED OF SULPHATES OF ALKALI METALS, ETC. Chemische Fabrik Buckau, and A. L. Mond. May 23. 14549.

PRODUCTION OF POTASSIUM CARBONATE. Chemische Fabrik Buckau and A. L. Mond. May 27. 15093.

METHOD FOR PRODUCTION OF TRIMETHYLENETRINITRAMINE. Dinamite Nobel Soc. Anon. Italiana. May 25. (Italy, May 27, '31.) 14855.

DISINFECTANTS, ETC. E. I. Du Pont de Nemours and Co. May 26. (United States, May 26, '31.) 15022.

APPARATUS FOR EVAPORATION OF LIQUIDS, ETC. E. M. S. Industrial Processes, Ltd. and R. A. Stokes. May 28. 15237.

TREATING CYANIDE SOLUTIONS. T. Ewan, Imperial Chemical Industries, Ltd., and R. J. Lemmon. May 24. 14775.

MANUFACTURE OF ORTHO-OXYAZO-DYESTUFFS. W. W. Groves (*I. G. Farbenindustrie*). May 23. 14621.

MANUFACTURE OF LAKES. A. A. Harrison, and Imperial Chemical Industries, Ltd. May 25. 14848.

MANUFACTURE OF HYDROCARBONS OF HIGH MOLECULAR WEIGHT. J. Y. Johnson (*I. G. Farbenindustrie*). May 28. 15207.

PURIFYING CRUDE MONTAN WAX. J. Y. Johnson (*I. G. Farbenindustrie*). May 28. 15208.

DYEING CELLULOSE ESTERS, ETC. I. G. Farbenindustrie. May 25. (Germany, May 26, '31.) 14872.

MANUFACTURE OF DYESTUFFS. I. G. Farbenindustrie. May 26. (Germany, May 26, '31.) 14988.

PRODUCTION OF ZIRCONIA. Imperial Chemical Industries, Ltd., and F. L. Clark. May 23. 14642.

MANUFACTURE OF POROUS PLASTER. Imperial Chemical Industries, Ltd. May 24. 14773.

DISINFECTING OR FUMIGATING. Imperial Chemical Industries, Ltd. May 24. 14774.

MANUFACTURE OF TUBES FOR HEAT-EXCHANGERS, ETC. Imperial Chemical Industries, Ltd. May 25. 14847.

PRODUCTION OF VITREOUS WARE. Imperial Chemical Industries, Ltd. and F. L. Clark. May 26. 14952.

EMULSIFYING AGENTS. Imperial Chemical Industries, Ltd., and A. MacArthur. May 27. 15083.

PURIFYING ZINC VAPOUR. New Jersey Zinc Co. May 27. (United States, May 28, '31.) 15151.

MANUFACTURE OF FERTILISERS. E. L. Pease. May 24. 14737.

METHOD OF PREPARING METALLIC OXIDES. Soc. des Carburants Synthétiques. May 25. (France, June 2, '31.) 14866.

OBTAINING ALCOHOLS. Soc. des Carburants Synthétiques. May 25. (France, June 11, '31.) 14867.

DYESTUFFS, ETC. Soc. of Chemical Industry in Basle. May 27. (Switzerland, May 28, '31.) 15130.

CATALYSTS FOR HYDROGENATION OF ORGANIC MATERIALS. R. A. A. Taylor. May 27. 15066.

MANUFACTURE OF PHOSPHORUS. Victor Chemical Works. May 24. (United States, June 8, '31.) 14722.

PREPARATION OF CARBIDE OF CALCIUM. H. K. Walker. May 25. 14790.

CRYSTALLISATION OF METASILICATES. J. A. Alcock. June 2. 15707.

PREPARATION, SEPARATION, OR PURIFICATION OF SALT SOLUTIONS, ETC. G. Austerweil. June 2. (Germany, June 2, '31.) 15686.

MANUFACTURE AND APPLICATION OF ASSISTING AGENTS. A. G. Bloxam (*Soc. of Chemical Industry in Basle*). May 31. 15451.

PRODUCTION OF DYE BATHS, ETC. H. T. Böhme Akt.-Ges. June 4. (Germany, July 9, '31.) 15739.

MANUFACTURE OF SUBSTITUTED ALKYL CHLORIDES. Boot's Pure Drug Co., Ltd., H. H. L. Levene, and F. L. Pyman. June 4. 15856.

BASIC DYESTUFFS. J. S. H. Davies, Imperial Chemical Industries, Ltd., C. Jeanprost, and H. A. Piggott. June 4. 15786.

Weekly Prices of British Chemical Products

Review of Current Market Conditions

The following notes on the chemical market conditions in Great Britain are based on direct information supplied by the British manufacturers concerned, and unless otherwise qualified the figures quoted apply to fair quantities, net and naked at makers' works. Where no locality is indicated, the prices are general for the United Kingdom. Particulars of the London chemical market are specially supplied to THE CHEMICAL AGE by R. W. Greeff and Co., Ltd., and Chas. Page and Co., Ltd., and those of the Scottish chemical market by Chas. Tennant and Co., Ltd.

IN London the market for coal tar products is still uninteresting, and prices remain unchanged. Relatively few price changes have occurred on the Manchester chemical market during the past week, and of the few that have to be reported the majority represent slight shadings. Meanwhile, there has been no expansion on this centre in the rate at which new business is being placed. Orders this week have been for small quantities in most cases and spread over comparatively short delivery periods. Business generally has been quiet in the Scottish market, with prices fairly steady.

General Chemicals

ACETONE.—LONDON: £65 to £68 per ton; SCOTLAND: £66 to £68 ex wharf, according to quantity.

ACID, ACETIC.—Tech. 80%, £37 5s. to £39 5s.; pure 80% £38 5s. to £40 5s.; tech., 40%, £19 15s. to £21 15s.; tech., 60%, £28 10s. to £30 10s. SCOTLAND: Glacial 98/100%, £48 to £50; pure 80%, £38 5s.; tech. 80%, £37 5s. d/d buyers' premises Great Britain. MANCHESTER: 80%, commercial, £39; tech. glacial, £52.

ACID, BORIC.—SCOTLAND: Granulated commercial, £26 10s. per ton; B.P. crystals, £35 10s.; B.P. powder, £36 10s. in 1-cwt. bags d/d free Great Britain in one-ton lots upwards.

ACID, CHROMIC.—11d. per lb., less 2½% d/d U.K.

ACID, CITRIC.—1s. 1d. per lb. LONDON: 1s. 1d., less 5%.

ACID, CRESYLIC.—97/99%, 1s. 6d. to 1s. 8d. per gal.; 99/100%, 1s. 9d. to 2s.

ACID FORMIC.—LONDON: £50 per ton. *£52.

ACID, HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d according to purity, strength and locality. SCOTLAND: Arsenical quality, 4s.; dearsenicated, 5s. ex works, full wagon loads.

ACID, LACTIC.—LANCASHIRE: Dark tech.. 50% by vol., £23 10s. per ton; 50% by weight, £27 10s.; pale tech., 50% by vol., £27; 50% by weight, £32; 80% by weight, £52; edible, 50% by vol., £40. One-ton lots ex works, barrels free.

ACID, NITRIC.—80° Tw. spot, £20 to £25 per ton makers' works, according to district and quality. SCOTLAND: 80°, £23 ex station full truck loads.

ACID, OXALIC.—LONDON: £47 per ton in casks, £48 10s. in kegs. SCOTLAND: 98/100%, £49 to £52 ex store. MANCHESTER: £47 10s., ex store.

ACID, SULPHURIC.—Average prices f.o.r. British makers' works, with slight variations owing to local considerations: 140° Tw. crude acid, £3 per ton; 168° Tw. arsenical £5 10s.; 168° Tw. non-arsenical, £6 15s. SCOTLAND: 144° quality, £3 12s. 6d.; 168°, £7; dearsenicated, 20s. per ton extra.

ACID, TARTARIC.—1s. 0½d. per lb. SCOTLAND: B.P. crystals, 1s. 1d. to 1s. 1½d., less 5% carriage paid. MANCHESTER: 1s. 0½d.

ALUM.—SCOTLAND: Lump potash, £9 per ton ex store.

ALUMINA SULPHATE.—LONDON: £8 5s. to £9 10s. per ton. *£7 10s. SCOTLAND: £8 to £8 10s. ex store.

AMMONIA, ANHYDROUS.—Spot, 10d. per lb. d/d in cylinders. SCOTLAND: 10d. to 1s. containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb. d/d, according to quantity.

AMMONIUM CARBONATE.—SCOTLAND: Lump, £36 per ton; powdered, £38, in 5-cwt. casks d/d U.K. stations or f.o.b. U.K. ports.

AMMONIUM CHLORIDE.—£37 to £45 per ton, carriage paid. LONDON: Fine white crystals, £19 to £20. (See also Salammoniac.)

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton, carriage paid according to quantity. (See also Salammoniac.)

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

ANTIMONY OXIDE.—SCOTLAND: Spot, £24 per ton, c.i.f. U.K. ports.

ANTIMONY SULPHIDE.—Golden 6½d. to 1s. 1½d. per lb.; crimson, 1s. 4d. to 1s. 6d. per lb. according to quality.

ARSENIC.—LONDON: £24 10s. c.i.f. main U.K. ports for imported material; Cornish nominal, £26 10s. f.o.r. mines. SCOTLAND: White powdered £27 ex wharf; spot, £27 10s. ex store. MANCHESTER: White powdered Cornish, £26 10s. at mines.

ARSENIC SULPHIDE.—Yellow 1s. 6d. to 1s. 8d. per lb.

BARIUM CHLORIDE.—£11 to £11 10s. per ton.

BISULPHIDE OF LIME.—£7 10s. per ton f.o.r. London, packages free.

BLEACHING POWDER.—Spot 35/37% £7 10s. per ton d/d station in casks, special terms for contract. SCOTLAND: £8 15s. in 5/6 cwt. casks.

BORAX, COMMERCIAL.—Granulated £15 10s. per ton, powder £17, packed in 1-cwt. bags, carriage paid any station Great Britain. Prices are for 1-ton lots and upwards.

* Prices quoted by other manufacturers.

CADMIUM SULPHIDE.—3s. 6d. to 3s. 9d. per lb.

CALCIUM CHLORIDE.—Solid 70/75% spot £5 5s. to £5 15s. per ton d/d station in drums.

CARBON BISULPHIDE.—£30 to £32 per ton, drums extra.

CARBON BLACK.—5d. to 5⅛d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £55 per ton, drums extra.

CHROMIUM OXIDE.—10d. to 10½d. per lb. according to quantity d/d U.K. Green 1s. 2d. per lb.

CHROMETAN.—Crystals 3¾d. per lb. Liquor £19 10s. per ton d/d.

COPPERAS (GREEN).—SCOTLAND: £3 15s. per ton, f.o.r., or ex works.

CREAM OF TARTAR.—LONDON: £5 2s. 6d. to £5 3s. 6d. per cwt.

FORMALDEHYDE.—LONDON: £27 to £27 10s. per ton. *£30. SCOTLAND: 40%, £28 10s. ex store.

HYDROGEN PEROXIDE.—LONDON: *100 vols. 10d. per lb.

LAMPBLACK.—£46 to £50 per ton.

LEAD, ACETATE.—LONDON: White, £39 to £41 per ton. Brown £1 per ton less. SCOTLAND: White Crystals £42 to £44 c.i.f. U.K. ports. Brown £1 per ton less. MANCHESTER: White, £35; Brown, £34.

LEAD, NITRATE.—£28 10s. per ton.

LEAD, RED.—SCOTLAND: £28 10s. per ton d/d buyer's works.

LEAD, WHITE.—SCOTLAND: £40 per ton carriage paid.

LITHOPONE.—30%, £20 to £22 per ton.

MAGNESITE.—SCOTLAND: Ground Calcined £9 per ton ex store.

METHYLATED SPIRIT.—61 O.P. Industrial 1s. 8d. to 2s. 3d. gal. Pyridinised Industrial, 1s. 10d. to 2s. 5d. Mineralised, 2s. 9d. to 3s. 3d. 64 O.P. 1d. extra in all cases. Prices according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 8d. to 2s. 3d.

NICKEL AMMONIUM SULPHATE.—£38 per ton d/d.

NICKEL SULPHATE.—£38 per ton d/d.

POTASH, CAUSTIC.—£30 to £33 per ton. LONDON and MANCHESTER: £42.

POTASSIUM BICHROMATE.—Crystals and Granular, 5d. per lb. net d/d U.K. Discount according to quantity. Ground 5¾d. LONDON: 5d. per lb. with usual discounts for contracts. SCOTLAND: 5d. d/d U.K. or c.i.f. Irish Ports with allowance for contracts. MANCHESTER: 5d.

POTASSIUM CARBONATE.—SCOTLAND: 96/98% spot £28 per ton ex store. LONDON: £31 10s. to £32. MANCHESTER: £31.

POTASSIUM CHLORATE.—3¾d. per lb. export London in 1-cwt. kegs. LONDON: £37 to £40 per ton. SCOTLAND: 99½/100% powder, £34. MANCHESTER: £36.

POTASSIUM CHROMATE.—6½d. per lb. d/d U.K.

POTASSIUM NITRATE.—SCOTLAND: Refined Granulated £28 per ton c.i.f U.K. ports. Spot £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 8½d. to 9d. per lb. SCOTLAND: B.P. crystals, 8½d. MANCHESTER: Commercial, 8d.; B.P., 8½d.

POTASSIUM PRUSSIATE.—LONDON: 8½d. to 9d. per lb. SCOTLAND: Yellow spot material, 8½d. ex store. MANCHESTER: Yellow, 8½d.

SALAMMONIAC.—First lump spot, £42 17s. 6d. per ton d/d in barrels.

SODA ASH.—58% spot, £6 per ton f.o.r. in bags, special terms for contracts.

SODA, CAUSTIC.—Solid 76/77° spot £14 10s. per ton d/d station. SCOTLAND: Powdered 98/99% £17 10s. in drums, £18 15s. in casks. Solid 76/77% £14 10s. in drums. 70/72% £14 12s. 6d. carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less. MANCHESTER: £12 15s. to £14 contracts.

SODA CRYSTALS.—Spot £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£21 to £22 per ton.

SODIUM BICARBONATE.—Refined spot £10 10s. per ton d/d station in bags. SCOTLAND: Refined recrystallised £10 10s. ex quay or station. MANCHESTER: £10 10s.

SODIUM BICHROMATE.—Crystals cake and powder 4d. per lb. net d/d U.K. discount according to quantity. Anhydrous 5d. per lb. LONDON: 4d. per lb. with discounts for quantities. SCOTLAND: 4d. delivered buyer's premises with concession for contracts. MANCHESTER: 4d. less 1 to 3½% contracts, 4d. spot lots.

SODIUM BISULPHITE POWDER.—60/62%, £16 10s. per ton d/d 1-cwt. iron drums for home trade.

SODIUM CARBONATE (SODA CRYSTALS).—SCOTLAND: £5 to £5 5s. per ton ex quay or station. Powdered or pea quality 7s. 6d. per ton extra. Light Soda Ash £7 ex quay, min. 4-ton lots with reductions for contracts.

SODIUM CHLORATE.—2¾d. per lb. LONDON: £29 per ton. *£32 10s. MANCHESTER: £29.

SODIUM CHROMATE.—3⅝d. per lb. d/d U.K.

SODIUM HYPOSULPHITE.—SCOTLAND: Large crystals English manufacture £9 5s. per ton ex stations, min. 4-ton lots. Pea crystals

£15 ex station 4-ton lots. MANCHESTER: Commercial, £9 5s.; photographic, £15.

SODIUM NITRITE.—Spot £19 to £22 per ton d/d station in drums.

SODIUM PERBORATE.—LONDON: 10d. per lb.

SODIUM PHOSPHATE.—£13 to £15 per ton f.o.r. London casks free. LONDON and MANCHESTER: £13.

SODIUM PRUSSIATE.—LONDON: 5d. to 5½d. per lb. SCOTLAND: 5d. to 5¾d. ex store. MANCHESTER: 5d. to 6d.

SODIUM SILICATE.—140° Tw. Spot £8 5s. per ton d/d station returnable drums.

SODIUM SULPHATE (GLAUBER SALTS).—£4 2s. 6d. per ton d/d. SCOTLAND: English material £3 15s.

SODIUM SULPHATE (SALT CAKE).—Unground Spot £3 15s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 2s. 6d.

SODIUM SULPHIDE.—Solid 60/62% Spot £10 15s. per ton d/d in drums. Crystals Spot £7 15s. per ton d/d in casks. SCOTLAND: For home consumption, Solid 60/62%, £10 5s.; broken 60/62%, £11 5s.; crystals, 30/32%, £8 2s. 6d. d/d buyer's works on contract, min. 4-ton lots. Spot solid 5s. per ton extra. Crystals, 2s. 6d. per ton extra. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8.

SODIUM SULPHITE.—Pea crystals spot, £13 10s. per ton d/d station in kegs. Commercial spot £9 10s. d/d station in bags.

SULPHATE OF COPPER.—MANCHESTER: £17 per ton f.o.b.

SULPHUR.—£12 5s. per ton. SCOTLAND: Flowers, £12 10s.; roll, £12; rock, £9. Ground American, £12 ex store.

SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quality.

SULPHUR PRECIP.—B.P. £55 to £60 per ton according to quantity. Commercial, £50 to £55.

VERMILION.—Pale or deep, 5s. 2d. to 5s. 5d. per lb.

ZINC CHLORIDE.—SCOTLAND: British material, 98%, £18 10s. per ton f.o.b. U.K. ports.

ZINC SULPHATE.—LONDON and SCOTLAND: £12 per ton.

ZINC SULPHIDE.—1s. to 1s. 2d. per lb.

Intermediates and Dyes

IN the following list of Intermediates delivered prices include packages except where otherwise stated:—

ACID, BENZOIC, B.P. (ex Toluol).—1s. 9½d. per lb.

ACID, GAMMA.—Spot, 4s. per lb. 100% d/d buyer's works.

ACID H.—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.

ACID, NEVILLE AND WINTHER.—Spot, 3s. per lb. 100% d/d buyer's works.

ACID, SULPHANILIC.—Spot, 8d. per lb. 100% d/d buyer's works.

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.

BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra.

BENZIDINE BASE.—Spot, 2s. 5d. per lb. 100% d/d buyer's works.

o-CRESOL 30/31° C.—£2 6s. 5d. per cwt., in 1-ton lots.

m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.

p-CRESOL.—34.5° C.—1s. 9d. per lb., in ton lots.

DICHLORANILINE.—2s. 2d. per lb.

DIMETHYLANILINE.—Spot, 1s. 6d. per lb., package extra.

DINITROBENZENE.—8½d. per lb.

DINITROTOLUENE.—48/50° C., 8½d. per lb.; 66/68° C., 9d. per lb.

DIPHENYLAMINE.—Spot, 2s. per lb., d/d buyer's works.

a-NAPHTHOL.—Spot, 2s. 4d. per lb., d/d buyer's works.

B-NAPHTHOL.—Spot, £75 per ton in 1-ton lots, d/d buyer's works.

a-NAPHTHYLAMINE.—Spot, 11½d. per lb., d/d buyer's works.

B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.

o-NITRANILINE.—5s. 10d. per lb.

m-NITRANILINE.—Spot, 2s. 7d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 6½d. per lb.; 5-cwt. lots, drums extra.

NITRONAPHTHALENE.—9d. per lb.

SODIUM NAPHTHIONATE.—Spot, 1s. 9d. per lb.

o-TOLUIDINE.—Spot, 9½d. per lb., drums extra, d/d buyer's works.

p-TOLUIDINE.—Spot, 1s. 9d. per lb., d/d buyer's works.

m-XYLIDINE ACETATE.—3s. 6d. per lb., 100%.

Coal Tar Products

ACID, CARBOLIC (CRYSTALS).—5½d. to 6¾d. per lb. Crude, 60's 1s. 5½d. to 1s. 6½d. per gal. SCOTLAND: Sixties, 1s. 7d. to 1s. 8d.

ACID, CRESYLIC.—99/100, 1s. 7d. per gal.; B.P., 2s. to 2s. 2d.; Refined, 1s. 9d. to 1s. 11d.; Pale, 98%, 1s. 6d. to 1s. 7d.; Dark, 1s. 4d. to 1s. 4½d. LONDON: 98/100%, 1s. 6d. Dark 95/97%, 1s. 4d. SCOTLAND: Pale 99/100%, 1s. 3½d. to 1s. 4½d.; 97/99%, 1s. 1½d. to 1s. 2½d.; dark 97/99%, 1s. 0½d. to 1s. 1½d.; high boiling acid, 2s. 6d. to 3s.

BENZOL.—At works, crude 7d. to 7½d. per gal. Standard motor, 1s. 2d. to 1s. 3d.; 90%, 1s. 3d. to 1s. 4d. Pure, 1s. 6d. to 1s. 7d. LONDON: Motor, 1s. 5½d. SCOTLAND: Motor, 1s. 3½d. to 1s. 4½d.; 90%, 1s. 9½d. to 1s. 10½d.

CREOSOTE.—Standard for export, 4¾d. to 5d. nett per gal. f.o.b. for Home, 3¾d. d/d. LONDON: 3d. to 3½d. f.o.r. North; 4d. to 4½d. London. MANCHESTER: 3¾d. to 4¾d. SCOTLAND: Specification oils, 3¾d. to 4¼d.; washed oil, 4d. to 4½d.; light, 3¾d. to 4¼d.; heavy, 4½d. to 5d.

NAPHTHA.—Solvent, 90/160, 1s. 4d. to 1s. 5d. per gal.; 95/160, 1s. 4½d.; 90/190, 1s. 1d. to 1s. 2d. LONDON: Solvent, 1s. 1½d. to 1s. 2d.; heavy, 11d. to 1s. 0½d. f.o.r. SCOTLAND: 90/160, 1s. 3d. to 1s. 3½d.; 90/190, 1s. 1d. to 1s. 2d.

NAPHTHALENE.—Purified crystals, £9 10s. per ton in bags. LONDON: Fire lighter quality, £3 to £3 10s.; 74/76 quality, £4 to £4 10s.; 76/78 quality, £5 10s. to £6. SCOTLAND: 40s. to 50s.; whizzed, 65s. to 70s.

PITCH.—Medium soft, 95s. per ton in bulk at makers' works.

PYRIDINE.—90/140, 3s. 9d. per gal.; 90/160, 4s. to 4s. 6d.; 90/180, 2s. to 2s. 6d. SCOTLAND: 90/160%, 4s. to 5s.; 90/220%, 3s. to 4s.

REFINED COAL TAR.—SCOTLAND: 5d. to 5½d. per gal.

TOLUOL.—90%, 2s. 2d. per gal.; Pure, 2s. 6d.

XYLOL.—1s. 9d. per gal.; Pure, 1s. 11d.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8 per ton. Grey, £12. Liquor, 8d. to 9d. per gal. MANCHESTER: Brown, £7 5s.; grey, £11.

ACETIC ACID, TECHNICAL, 40%.—£16 15s. to £18 per ton.

ACETONE.—£63 to £65 per ton.

AMYL ACETATE, TECHNICAL.—95s. to 110s. per cwt.

CHARCOAL.—£7 10s. to £12 per ton.

IRON LIQUOR.—24°/30° Tw., 10d. to 1s. 2d. per gal.

WOOD CREOSOTE.—1s. to 2s. 6d. per gal., unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. to 4s. per gal. Solvent, 3s. 9d. to 4s. 9d. per gal.

WOOD TAR.—£2 to £6 per ton.

BROWN SUGAR OF LEAD.—£32 per ton.

Latest Oil Prices

LONDON, June 8.—LINSEED OIL was steady. Spot, small quantities, £16; June, £12 15s.; July-Aug. £13 5s.; Sept.-Dec., £13 15s.; Jan.-April, £14 15s. per ton, naked. RAPE OIL was quiet. Crude, extracted, £28; technical, refined, £30 per ton, naked, ex wharf. COTTON OIL was steady. Egyptian, crude, £20; refined common edible, £23; and deodorised, £25 per ton, naked, ex mill. TURPENTINE was steady. American, spot and July, 59s. per cwt.

HULL.—LINSEED OIL, spot, £12 17s. 6d.; June, £12 10s.; July-Aug., £12 17s. 6d.; Sept.-Dec., £13 2s. 6d.; Jan.-April, £14 per ton. COTTON OIL.—Egyptian crude, spot, £20; edible refined, spot, £22 5s.; technical, spot, £22 5s.; deodorised, £23 10s. per ton, naked. PALM KERNEL OIL.—Crude, f.m.q., spot, £20 10s. per ton, naked. GROUNDNUT OIL.—Crushed-extracted, spot, £30 10s.; deodorised, £34 10s. per ton. RAPE OIL.—Crushed-extracted, spot, £27; refined, £28 10s. per ton. SOYA OIL.—Crushed-extracted, spot, £19 10s.; deodorised, £22 10s. per ton. COD OIL, 16s. per cwt. CASTOR OIL.—Pharmacy, spot, 40s. 6d.; first, 35s. 6d.; second, 30s. 6d. per cwt. TURPENTINE.—American, spot, 60s. per cwt.

Nitrogen Fertilisers

SULPHATE OF AMMONIA.—*Export.*—During the week small quantities were offered, and as there was little demand for prompt shipment the price weakened to £4 5s. per ton fo.b. U.K. port in single bags. It is not anticipated that there will be much interest in this product until next season's prices are announced. *Home.*—Manufacturers were still selling small lots at £5 10s. to £7 per ton delivered to consumers' stations. As the consuming season is practically over little interest has been displayed.

NITRATE OF SODA.—Imported nitrate remains at £9 per ton delivered in 6-ton lots, and the British product at £8 16s.

NITRO-CHALK.—Remains unchanged at £7 5s. per ton, and sales are normal for this time of year.

New Chemical Trade Marks

Compiled from official sources by Gee and Co., Patent and Trade Mark Agents, 51 and 52 Chancery Lane, London, W.C.2.

Opposition to the registration of the following trade marks can be lodged up to July 1, 1932.

Glyacon. 528,446. Class 1. Chemical substances for use as solvents or as softening agents in the course of the manufacture of lacquers or of cellulose derivatives or of articles made from cellulose derivatives. C. F. Boehranger and Soehne Gesellschaft mit Beschränkter Haftung (a joint stock company duly organised under the laws of Germany), Sandhoferstrasse 112 to 132, Mannheim-Waldhof, Germany. January 8, 1932.

Lorynol. 529,723. Class 4. Oils and fats for use in manufactures not included in other Classes. H. Th. Böhme Aktien-Gesellschaft (a joint stock company organised under the laws of Germany), 29 Moritzstrasse, Chemnitz, Germany. February 25, 1932.

Ricoal. 531,351. Class 4. Raw or partly prepared vegetable or mineral substances used in manufactures, not included in other classes. The Illingworth Carbonisation So., Ltd., 16 Kennedy Street, Manchester. April 26, 1932.

* Prices quoted by other manufacturers.

From Week to Week

MR. E. J. FOX, managing director of the Stanton Ironworks Co., Ltd., has been elected chairman of the Council of the Society of British Gas Industries for the coming year.

PROFESOR R. V. WHEELER, of the Department of Fuel Technology, University of Sheffield, spoke on "Gas as a rival to Petrol for Motor Cars," at the monthly luncheon of the Oil Industries Club held in London on Tuesday, June 7.

THE SULPHIDE CORPORATION, LTD., Seaton Carew, near West Hartlepool, has decided to erect plant for zinc products used in the manufacture of paint. These products are entirely unlike anything the Sulphide Corporation have hitherto produced, and it is anticipated that the first unit of the new plant will be working in three or four months. It is understood that about 500 men will be employed.

ACCORDING TO INFORMATION FROM PARIS some of the restrictions imposed on British exports to France have been removed by the French Government. In future certain important British exports will be exempt from the 15 per cent. surtax imposed by France on the exports of countries with depreciated currencies. Among the most important products which will be exempt from the surtax are iron and steel tools and dyestuffs.

A SUDDEN INCREASE IN THE PRICE of petrol by two francs per five-litre can (roughly, 4½d. a gallon) by most of the Paris garage keepers has caused much criticism in the city. The retailers state that they are compelled to increase the price because they have been informed that wholesale prices will be raised. The distributing companies will not make any comment on the subject, which coincides with the report that many oil companies are considering altering their prices, following the breakdown of the New York conference.

THE DIRECTORS of Imperial Chemical Industries, Ltd., are extending the system of making advances to employees for the payment of income tax. Under the scheme employees will be able to obtain advances in respect of tax due for payment on July 1 and also for the January and July instalments in 1933. Through the scheme not only will the Treasury collect taxes promptly, but employees will be enabled to meet their obligations to the company with the least possible inconvenience.

A GENERAL MEETING of the members of the Royal Institution was held on June 6, Sir Robert Robertson, treasurer and vice-president, being in the chair. The chairman reported that the managers had received from the Becker family a gift of a number of Faraday letters; from Mr. D. O. Wollaston, Dr. Wollaston's camera lucida; and from Professor J. C. McLennan the apparatus in which the liquid helium, used in the demonstration at his evening discourse last Friday, was transported from Holland. Mr. Cecil Rowntree was elected a member.

A BRANCH of the National Association of Clayworks Managers has been formed at Swansea. The first president of the branch is Sir Alfred Stephens, Kidwelly. Mr. T. Adrian Goskar (Morriston) has been elected chairman, Mr. T. B. Taylor (Skewen) vice-chairman, Mr. P. W. Hood Williams secretary, while Messrs. G. D. Thomas (Llanelly), E. L. Bevan (Pontardawe), and K. Y. Perkins (Morriston) are committee members. Mr. A. B. Searle, the ceramic expert, visited the branch last week-end and read a paper on "What Properties should a Good Brick Possess?"

THE SEVENTEENTH GUTHRIE LECTURE to the Physical Society will be delivered on June 17, at the Imperial College of Science and Technology, South Kensington. Dr. Max Planck (formerly Professor in Berlin), is this year's lecturer, and his subject will be "The Concept of Causality in Physics." Professor Planck is famous for his contributions to thermo-dynamical theory and its applications, and as the author of the quantum theory. He was led to the study of the problems of black body radiation by his preoccupation with thermo-dynamical questions, and his success in solving these problems—or rather the comprehensive and fundamental problem of the energy distribution—was partly due to his recognition of the fact that the observed energy distribution was incompatible with classical principles, and also that Boltzmann's notion of entropy needed something in the nature of discontinuous energy interchange to give it precision.

THE NEW SITUATION brought about by the imposition of tariffs encourages and requires undertakings in the steel and complementary trades to plan for the future and to enter into arrangements having for their object the economic development of the industry and the prevention of overlapping and duplication of plant for those markets where the productive capacity is already fully sufficient for the demand. Stewarts and Lloyds, Ltd., and the United Steel Companies Ltd., have issued an official statement in which they say they are of opinion that such development of the steel industry is in the national interest and believe that the expression of an intention by two or more undertakings to co-operate in a general policy will be helpful in advancing this object. The two companies therefore have agreed to co-operate in the policy of extensions in steel production and avoidance of uneconomic duplication of plant, to co-operate in sales policy, and to co-operate in research, technical development and production methods.

THE FIFTH ANNUAL GOLF COMPETITION for the cup presented by the British Drug Houses, Ltd., between chemists of Northern Ireland and the Irish Free State was played at Holywood on June 1, and resulted in a win for the Irish Free State.

AN EMPLOYEES' PHOTOGRAPHIC COMPETITION has been arranged by Imperial Chemical Industries, Ltd., with the object of promoting the company's sales of garden fertilisers. Entrants are invited to submit pictures of gardens treated with the fertilisers, the best of which will be reproduced.

THE WEDDING TOOK PLACE at St. Columba's, Pont Street, London, on Saturday, June 4, of Miss Barbara Siddall, daughter of Mr. James L. Siddall, managing director of I.C.I. Metals, and Mr. Stuart Digby Mitchell, whose family has been prominent in city linen trade circles for several generations. The bride's father, who is well-known for the active part he took in the development of South Africa after the war, was formerly director of the Cape Argus Company and of several diamond and gold mines.

TO MEET COMPETITION, which has always been keen in the electrical equipment industry, the Brush Electrical Engineering Co. has found it necessary to develop new lines of manufacture. Lord Vaux of Harrowden, the chairman, was unable to preside over the company's meeting on June 6, and Mr. F. R. Davenport read his address. On the turbine side, no orders were placed for the Brush-Ljungstrom unit in this country during 1931, but it is claimed that this Swedish design can show a higher efficiency than any other steam turbine plant, as demonstrated by a new unit erected in Sweden this year.

DAMAGE CAUSED BY A FIRE, on June 4, in the gelatine department of the factory of Bristol Manufacturers, Ltd., York Road, Bedminster, Bristol, is estimated at £20,000. A fireman on duty discovered flames from a motor which operates the drums and summoned the fire brigade. A floor 11 ft. above, on which was stored sacks of gelatine, became ignited and the fire spread to other parts of the building. The offices and analytical department escaped damage. The firm was particularly busy, sending gelatine to all parts of the world. Now, as a result of the fire, many employees will be idle.

SIR JOHN ADAMSON, formerly Vice-Chancellor of Grahamstown University, South Africa, spoke on "Individualism First and Last," at the 54th Individualist Luncheon at the Hotel Victoria, London, on Wednesday. The individualist, he said, was a person who was unique, radiant and with a sense of values, whereas the general effect of the social forces in the world to-day was to take the edge off uniqueness, to damp radiation and to distort values. There should be free passage for any individual through all the strata of social life, but there must be no social control. Sir Ernest Benn, who presided, said they were tired of the cry "Something must be done"; for the future it was that "Something must be undone."

WHEN THE HON. J. H. PARKER, of Plymouth, district goods manager of the Great Western Railway, placed the case for the railways before a special meeting of the Truro Chamber of Commerce on May 26, Mr. W. Rose asked what justification there was for an increase of 75 per cent. in the railway rates for china clay as compared with fifteen or twenty years ago. Mr. Parker replied that the standard increase of general rates was 60 per cent. as compared with pre-war. The maintenance of that increase was justified, he considered, by the fact that labour costs had increased by 120 per cent. A resolution was passed emphasising the need for the maintenance and development of both railways and road transport fairly and equitably in the interests of industry, trade and the community generally, and welcoming the appointment of the Commission to investigate all the facts and to ensure that both sections of the transport industry should perform their essential functions under satisfactory conditions.

Obituary

THOMAS PILKINGTON, of T. Pilkington and Co., Yew Tree Chemical Works, Collyhurst; aged 57 years.

A. E. JOWETT, for many years a well-known personality of the Kynoch works at Witton; following an operation.

WILLIAM EDWIN ROTHWELL, director of E. Rothwell and Sons, Ltd., cotton manufacturers, dyers, and finishers, of Walkden, near Manchester.

BRIGADIER-GENERAL L. W. DE VERE SADLEIR-JACKSON, a delegate director of the Lightning Fasteners group of the Imperial Chemical Industries, Ltd.; in a motoring accident.

CAPT. CHARLES THOMAS TYRER, R.A.F., son of the late Thomas Tyrer, F.I.C., F.C.S., on June 6. The cremation took place yesterday (Friday) at the City of London Cemetery.

THOMAS GIBSON, managing director of the Stafford Salt and Alkali Co., Ltd. Mr. Gibson was a pioneer of the salt industry and came to Stafford 40 years ago when brine was discovered during boring operations for water.

ANDREW SHORT, who at one time held the position of assistant demonstrator in the chemical department of Armstrong College, Newcastle-on-Tyne, and was later associated with the Blaydon Burn By-Product Works and Cookson Lead Works at Howdon-on-Tyne; aged 50 years.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]

INDUSTRIAL COLLOIDS, LTD., Manchester. (M., 11/6/32.) Registered May 23. £300 debenture to A. Taylor, 20 Grove Crescent, Weaste; general charge.

ITABIRA IRON ORE CO., LTD., London, E.C. (M., 11/6/32.) Registered May 26, mortgage and charge securing £6,000 (not ex.) further advances, to Brazilian Investment Synd. Ltd., 5 Fenchurch Street, E.C.; charged on lands, mining and other rights in Brazil and certain shares, also general charge. *£862,770. Dec. 31, 1931.

County Court Judgment

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

ABRAMS, M., 1 Travis Street, London Road, Manchester, chemical merchant. (C.C., 11/6/32.) £11 11s. 6d. May 5.

London Gazette, &c.

Company Winding Up Voluntarily

WRIGHT LAYMAN AND UMNEY, LTD. (C.W.U.V., 11/6/32.) By special resolution, May 30. Mr. Herbert Alfred Deed, of Evans, Fripp, Deed & Co., appointed liquidator.

Notice of Dividend

WILKINSON, GEORGE HAROLD, The Hollies, Haygate Road, Wellington, Salop, trading as "The Wrekin Chemical Co." First and final dividend 1s. 3d. per £, payable June 13, Midland Chambers, Warwick Passage, Corporation Street, Birmingham.

Partnership Dissolved

THE CHEMICAL PRODUCTS CO. (Chas. T. Alexander and H. Horace Ward), analytical chemists and chemical manufacturers, Aynsome, Lancaster, by mutual consent, May 12, 1932. Debts received and paid respectively by Herbert Horace Ward.

Chemical Trade Inquiries

Abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

CANADA.—A firm established this year in Montreal as refractory and combustion service engineers, and also for the manufacture of refractory cements seeks United Kingdom agencies for the sale of fireclay brick, silica brick, magnesite brick, dead-burned magnesite, chrome brick, dead-burned chrome, calcined fireclay, raw fireclay plastic, glass tank blocks and chemical stoneware, throughout the Dominion. (Ref. No. 979.)

FINLAND.—A Helsingfors firm of exporters desires to obtain the representation for Finland of United Kingdom manufacturers of creosote oil, etc. (Ref. No. 991.)

ITALY.—An agent at Genoa wishes to obtain the representation of United Kingdom firms for hardened fish oil and palm oil. (Ref. No. 999.)

LUXEMBURG.—A commission agent who is also an engineer at Luxemburg wishes to obtain the exclusive representation of United Kingdom suppliers of fireproof articles for blast furnaces, steel works and boilers, lime for steel works, coal briquettes for locomotives and coke for blast furnaces and for ordinary purposes. (Ref. No. 1,000.)

SOUTH AFRICA.—The British Trade Commissioner at Johannesburg reports that a local company is calling for tenders, to be presented in South Africa by August 12, for the supply, delivery and erection of a dolomite, magnesite and lime burning plant. (Ref. No. A.X.11364.)

Company News

CELANESE CORPORATION OF AMERICA.—The directors have declared a dividend equal to 87½ cents. per share on the 7 per cent. cumulative series prior preferred stock of the company, payable on July 1.

CANADIAN WALLPAPER MANUFACTURERS, LTD.—Owing to the trade depression the directors state that the results do not justify the payment of any dividend, and they propose to carry forward the balance of $302,185 standing at the credit of the profit and loss account.

ZINC CORPORATION, LTD.—The directors announce that the fixed dividend on the preference shares for the half-year ended June 30 will be paid on July 1, and that they recommend a participating dividend of 6d. per share on both classes of shares, also payable on July 1.

BOOTS PURE DRUG CO., LTD.—An interim dividend at the rate of 24 per cent. per annum, less tax, is announced on the ordinary shares for the quarter, payable on July 1. This is at the same rate as in the previous quarter.

BRITISH ALKALOIDS, LTD.—For the past year a net profit of £2,509 is reported. It is proposed to write off preliminary expenses £150, and to place to taxation reserve £450. After payment of the dividend on the preference shares there remains £408 to be carried forward.

WILLIAM CORY AND SON, LTD.—The directors recommend a final dividend of 10 per cent., less tax, on the ordinary shares and on the employees' shares, making 15 per cent., less tax, for the year to March 31, and a proportionate dividend on the employees' shares ranking for dividend from January 1, 1932. For the previous year the company paid a final dividend of 12½ per cent., making 17½ per cent. for the twelve months.

TURNER AND NEWALL, LTD.—The directors have declared an interim dividend on the ordinary stock on account of the year ending September 30 next of 1¾ per cent., actual, less tax, payable on July 23, 1932. The usual half-yearly dividend on the preference stock at 3½ per cent., actual, less tax, will be paid on June 18. The available profit for the half-year is stated to be sufficient to pay the preference dividend for the half-year, and an interim dividend of 2½ per cent. (last year's rate) on the ordinary stock.

MOUNTAIN COPPER CO.—It is announced that the loss during the year 1931 from the sale of pyrites, sundry products, etc., was £1,401. After deducting debenture interest, London expenses, etc., the debit balance is £6,967. The depreciation written off is £18,477, and has been provided for out of exchange reserve account and reserve and depreciation fund. The net expenditure charged to capital account is £7,236. The annual meeting will be held at 3 Lombard Street, London, on June 16, at 12 noon.

COSACH.—Holders of Bonds in the Prior Secured 7 per Cent. Sterling group have been informed that there has been received in respect of the first three months of 1932 the monthly payments required in order that the trustee should have in hand on the first of each month the accrual to date of the interest and sinking fund requirements plus six months' advance interest and sinking fund requirements, but that the payment for the month of April, 1932, has not been so received in full. The trustee is awaiting the results of the deliberations of the recently formed British and American protective committee.

BOOTS PURE DRUG CO.—A net profit of £731,891 was earned during the year ended March 31 last, against £722,264 for the previous year. With £220,343 brought in there is £952,234 available. The preference and preferred ordinary dividends absorb £96,750 and ordinary dividends already paid require £360,000. The directors again propose a bonus of 1s. per share, tax free, on the ordinary, which will take £75,000. It is further proposed to place £100,000 to general reserve, against £200,000, bringing that fund up to £1,400,000, and £100,000 to works development fund, leaving £220,484 to carry forward.

LEICESTERSHIRE (L. AND N.) COAL DISTILLATION.—The report for the eleven months ended November 30, 1931, states that the directors report, after protracted negotiations, a settlement of all outstanding obligations and claims between the company and "L. and N." Coal Distillation. The profit and loss account shows interest received £4,321. After charging distillation plant expenses, less proceeds of sales, etc., £2,365, administration expenses £461, tax £973, directors' fees accrued and unpaid £1,238, the debit balance is £716, to which is added the debit balance brought forward £17,430, making a total debit of £18,146 to be carried forward.

BRITISH TINTEX AND DYE PRODUCTS, LTD.—The accounts for the year to March 31, 1932, show a loss on trading of £5,901 without providing for loss made by Dominion Tintex and Dye Products, Ltd., amounting to £133, and without taking credit for surplus of £63 shown in accounts of Pastex Co. for year. In the last report it was intimated that arrangements had been made for sales in this country to be handled by a well-known firm of proprietary manufacturers. The Board then had hopes that the year ended March 31 last would show good net profits. These expectations were not realised. From March 1 last the company resumed control of its own sales organisation, and results for March to May showed that the company is making profit. The profit and loss account shows drop in gross profit from £12,557 to £4,950. Expenses amounted to £11,484, against expenditure for previous period of £28,028. The annual meeting will be held at Winchester House, London, on June 30, at 12 noon.

New Companies Registered

BARCLAY AND CO. (LIVERPOOL), LTD., 62 Holt Road, Kensington, Liverpool.—Registered June 1. Nominal capital, £2,000 in £1 shares. To acquire the business of a soap manufacturer now carried on by W. Griffiths at 62 Holt Road, Liverpool, as "Barclay and Co.," and to carry on the business of soap boilers, candle manufacturers, chemists, druggists, etc.

BRITISH VINEGARS, LTD., Caron Place, South Lambeth Road, London, S.W.8.—Registered as a private company on June 3. Nominal capital of £450,000 in £1 shares (130,000 7 per cent. cumulative preference, 240,000 ordinary and 80,000 deferred). The objects are to acquire all or any part of the undertaking, assets and goodwill of the businesses of makers of vinegar, vendors of pickles and sauces, and garage proprietors, now carried on by Beaufoy, Grimble and Co., Ltd., and of the business of makers of vinegar now carried on at Hull by the Distillers Co., Ltd., also to acquire all or any part (not being less than 90 per cent.) of the issued capital of Sarsons, Ltd., and Champion and Slee, Ltd., and to adopt three agreements (1) with Beaufoy, Grimble and Co., Ltd., (2) with Distillers Co., Ltd., and (3) with Crosse and Blackwell, Ltd., and the Distillers Co., Ltd.

ERNEST CROSS AND CO., LTD.—Registered June 1. Nominal capital, £5,000 in £1 shares. Manufacturers of and dealers in organic and inorganic chemicals, dyes, gasses, drugs, fertilisers, salts, acids, oils, colours, glues, gums, varnishes, chemical compositions, preparations and derivatives, laboratory and scientific furniture, wholesale chemical engineers, etc. Directors: E. Cross, 50 Perrymead, Prestwich, near Manchester; J. F. Strattman.

METAFILTRATION CO., LTD. Registered May 27. Nominal capital £5,000 in £1 shares. To acquire the business of Metafilters (1929), Ltd., and all or any of the assets or property thereof, and to carry on the business of metal manufacturers, smiths, engineers, electricians, founders, chemists, druggists, manufacturers of and dealers in chemical and other preparations and requisites or compounds, etc. A subscriber: A. W. Steed, St. Michael's Rectory, Cornhill, London, E.C.3. Directors: T. H. Minshall and E. W. Seeman.

MODERN CHEMICAL PRODUCTS, LIMITED, Orchard Works, Trout Road, Yiewsley, Middlesex.—Registered June 4. Nominal capital, £1,500 in £1 shares (1,000 8 per cent. cumulative preference and 500 ordinary). Objects: To carry on the business of chemical manufacturers, in particular manufacturers of decoratives and compounds of cellulose, etc. Directors: W. J. Cruddas, T. Griffin, K. S. Low.

WRIGHT, LAYMAN AND UMNEY (1932), LTD., 46 Southwark Street, London, S.E.1.—Registered as a "public" company on June 2. Nominal capital £340,000 in £1 shares (280,000 7 per cent. cumulative preference and 60,000 ordinary). To acquire the business of manufacturing, wholesale and export druggists carried on by Wright, Layman and Umney, Ltd., and the goodwill, trade-marks and certain property and assets; and to carry on the business of manufacturing, wholesale, consulting and analytical chemists and druggists, soap manufacturers and dealers, smelters and refiners of ores, drug grinders, etc. Directors: H. C. Wright, E. A. Umney, E. B. Layman, J. Knight, J. Hamerton, R. E. Conder.

Forthcoming Events

June 14.—Institution of Petroleum Technologists. Special Summer Meeting. 5.30 p.m. Demonstrations in the Lecture Theatre. Exhibition of Apparatus. John Street, Adelphi, London.

June 15.—Society of Glass Technology. Sheffield.

June 15.—Electroplaters' and Depositors' Technical Society. Annual Election of Committee and Officers. Northampton Polytechnic Institute, London.

June 15.—Society of Glass Technology. Luncheon. King's Head Hotel, 12.30 p.m. Ordinary General Meeting. Applied Science Department, The University, Sheffield. 2 p.m.

June 17.—The Physical Society. Seventeenth Guthrie Lecture. "The Concept of Causality in Physics." Dr. Max Planck. 5 p.m. Imperial College of Science and Technology, London.

June 28.—The National Physical Laboratory. Annual Visit of Inspection. 3 to 6 p.m. Teddington.

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